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Improved Methods in Locomobile Shop

Economical Arrangement of Machines Saves Floor Space and Increases Production—Thread Milling Reduces Costs—Unusual Turret Lathe Fixtures

BY L. S. LOVE

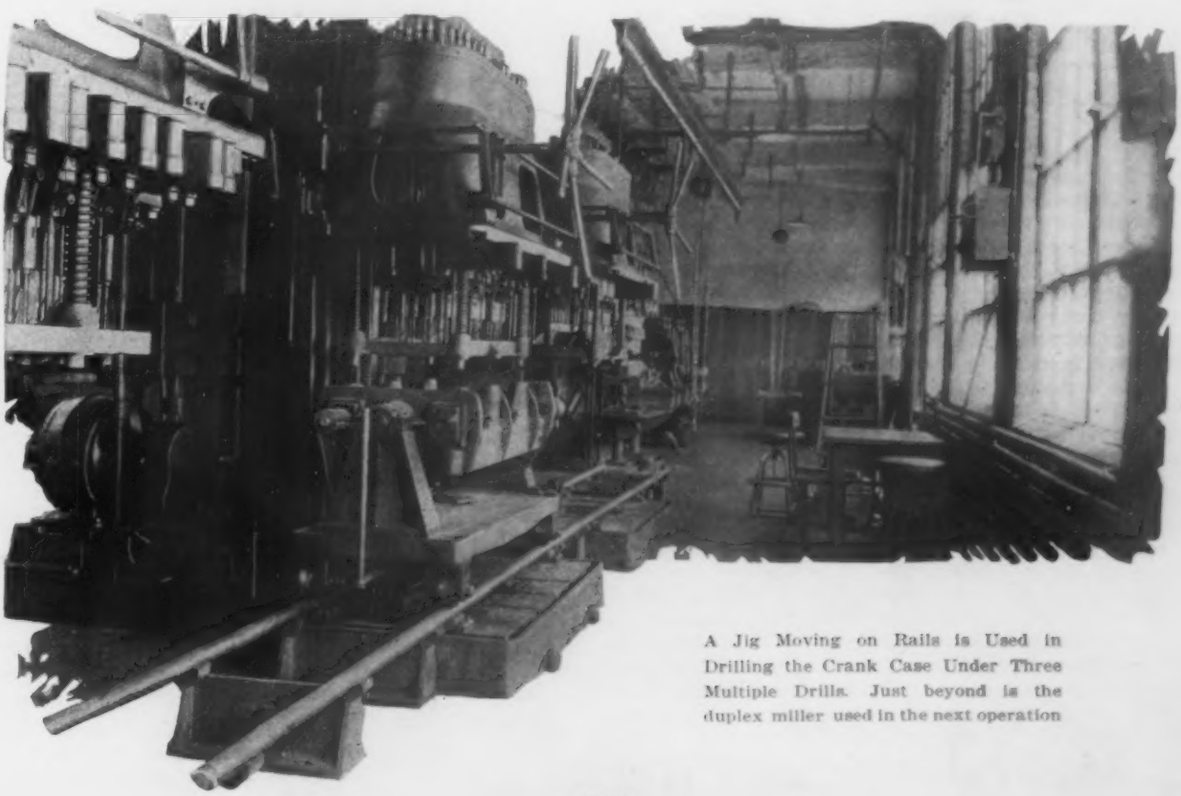
WITH the change in financial control and management last year of the Locomobile Co. of America, Bridgeport, Conn., have come many changes in manufacturing methods. While it is not feasible with an automobile such as the Locomobile to follow the practices of the shops producing lower priced cars, it has been possible to decrease materially some of the manufacturing costs, and at the same time maintain the quality expected by the car purchaser.

One of the first steps undertaken was the rearrangement of all the machine tools in the plant. In common with most plants of any age at all, the various stages of the growth of the business were apparent in the arrangement or rather lack of any systematic arrangement of the various producing units. Different classes of machines were more or less scattered, permitting no proper sequence of progressive operations and requiring a costly amount of interdepartment trucking.

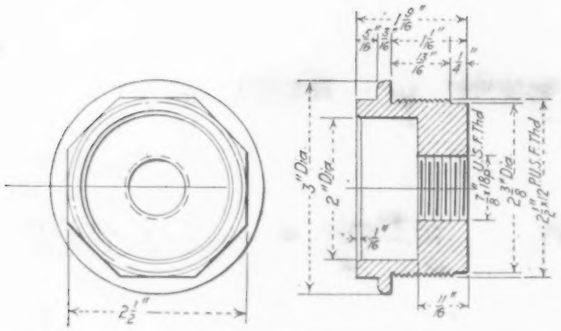
The company built an addition to one of the buildings, making it sufficiently large to accommodate all the machinery used in production of parts and assembly of the chassis. The machinery from various parts of other buildings was moved into this shop. Incidentally it was all handled on trailers hauled by gasoline and electric tractors. This work alone saved enough to pay for the tractors. The new building, judging by the amount of daylight illumination inside, would appear to be built chiefly of glass, and it has a saw tooth roof. Upper sheets of glass on the windows are coated with a green translucent paint to prevent glare, resulting in a shop which requires practically no artificial light at any point.

The layout for machinery was so planned that work might be handled in this shop by departments, work progressing from one machine to that standing next to it for the next succeeding operation. This arrangement, it is estimated, has reduced internal trucking costs 50 per cent.

As an example the cylinders, pistons and connecting



A Jig Moving on Rails is Used in Drilling the Crank Case Under Three Multiple Drills. Just beyond is the duplex miller used in the next operation



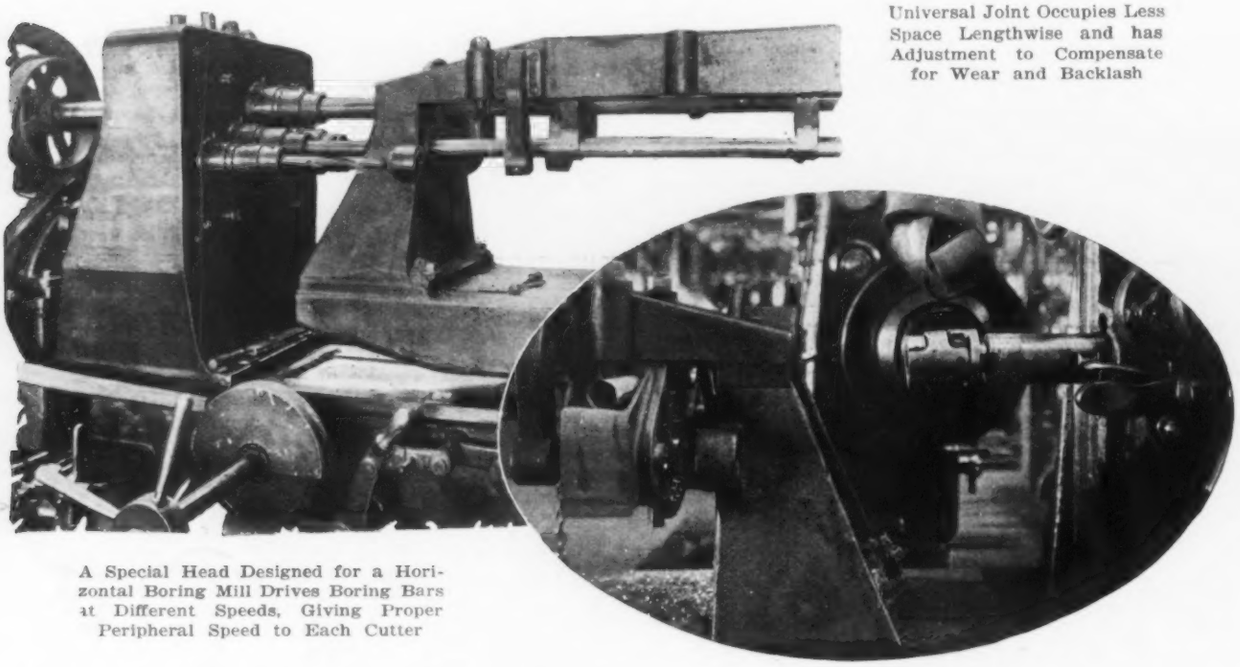
Making from Bar Stock on an Automatic Screw Machine Instead of from Malleable Iron Saves 6 Min. on Each Valve Cap

rods are machined in one department. Cylinders are bored, ground, drilled, and faced in one group of machines placed closely together. Where it is possible to combine two operations in one setting, this has been done. As for instance, cylinder blocks, which are cast in pairs, are set up in a planer type milling machine having two sets of housings, the first driving the cutters for rough milling, the second those for finish milling. The milling operation is completed as the table travels from one end of the machine to the other. The cylinders are tested hydraulically in this same department, after the lower faces have been ground for mounting on the crank case. For work which is sufficiently heavy to warrant their use, such as cylinder castings, monorail hoists are provided to transfer work from one machine to the next.

One exception to the rule of all operations in a department is the case of connecting rods. These are machined in one section, but go to another department for heat treatmnet and sand blasting, when they are returned to the first department where the crank shaft end or split bearing is ground on the joint faces in a vertical spindle surface grinder, and in the hole in an internal grinder. The wrist pin hole is broached before insertion of the bushing. Both bosses on the rod ends are turned in one setting. Inspection of finished parts takes place also in the department.

This same general method of procedure is followed in the production of crank cases and transmission cases, which are machined in adjacent sections. The crank case, a bronze casting, after having been rough milled and finish ground on both faces is mounted in a jig on a truck, the latter riding on pipe rails which extend under three multiple-spindle cluster-head drills. The first machine drills the holes in the bottom of the case and two locating pin holes which are used to register the casting in subsequent jigs. The casting is then turned over on the trunnions and all top holes drilled under the second machine, except those for the valve rod guide bushings, which are drilled in this same jig under the third machine. A feature of this jig is the mounting of the drill guide bushing plate on guide pins with spring backing. The guide pins enter holes in the fixture thus properly locating all holes. A chain hoist and monorail carries the case to the next machine, a duplex milling machine, where, using the locating pin holes above referred to, the case is milled on the ends for the mounting of timing gear housing, etc. Cylinder block holes are bored and crank shaft bearings are gang milled in the next following operations with the case registered in jigs from the same holes.

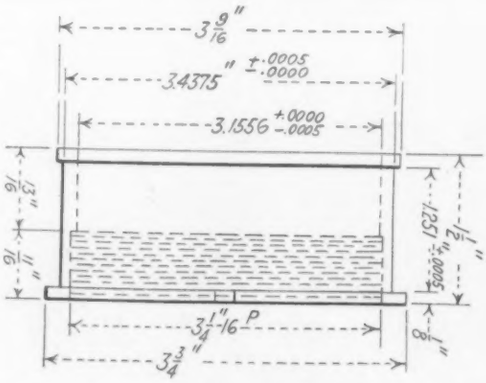
For rough boring main bearings, cam shaft bearings, and pump and magneto shaft bearings a special head has been designed and mounted on an old horizontal boring machine. The gear ratios in the driving mechanism of this special head have been so designed that each bar turns at a different rate, giving the proper peripheral speed for the cutters set at different diameters.



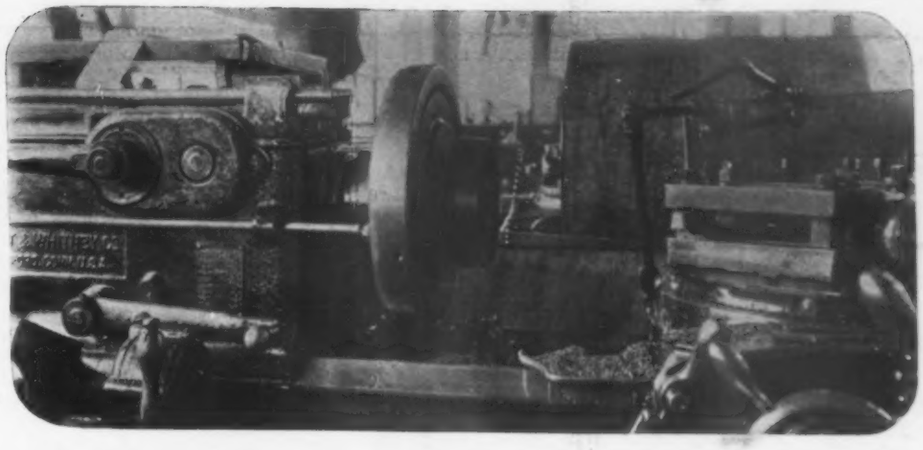
Universal Joint Occupies Less Space Lengthwise and has Adjustment to Compensate for Wear and Backlash

A Special Head Designed for a Horizontal Boring Mill Drives Boring Bars at Different Speeds, Giving Proper Peripheral Speed to Each Cutter

The finish boring or line reaming of these various shaft bearings is accomplished one at a time. The machine is a type of horizontal drill frequently seen. It is used for driving only, accuracy being held by the fixture. In order to secure a floating effect for the



Automatic Screw Machine and Thread Miller Triple Production over the Flat Turret Lathe on Steering Worm Adjusting Sleeve Guides, Holding to 0.0005 In. Limits



Retainer Clutch Disk is Finished Complete of Malleable Iron, Three Operations in 47 Min., Using Flat Turret Lathe and Floating Face Plate. This is finished to plus 0.000 in. minus 0.005 in. and after serrations are cut in gear shaper must be balanced

drive the company employs a specially designed universal joint which is much shorter than commercial types. The trunnions in this joint are hardened screw pins with tapered ends, permitting of adjustment for wear and backlash.

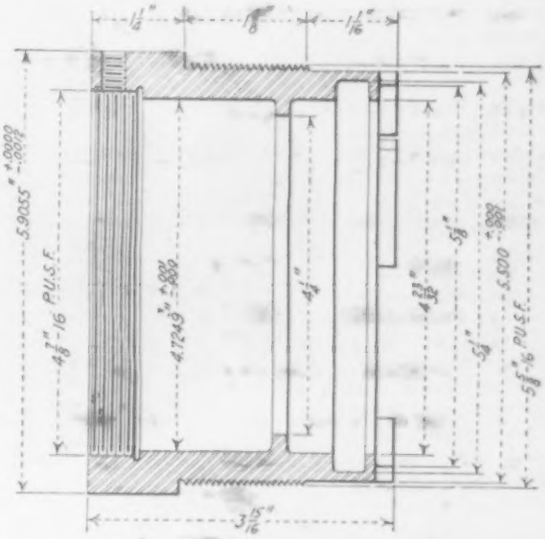
The oil pan, which is an aluminum casting, is fitted to the crank case in this department. It has been the practice to finish the edges of the two at the joint by chipping and filing. The company is now preparing to perform this operation in a profiling machine with a template.

In the regrouping of machinery a saving of 25 per cent in the floor space occupied has been effected. At the same time production has been increased 35 per cent, making an 80 per cent increased productivity of space used. Aisles 10 ft. wide have been laid between groups of machines leaving ample room for passage of trucks with two or three trailers.

The floor plan of the screw machine department is particularly effective, inasmuch as these machines require so much room for loading the feed tubes with fresh bar stock. All screw machines, grouped according to class and size of work handled, are placed at an angle down the length of the department thus permitting clearance for full lengths of bar stock through the department. At each end of the department is an aisle. Across the aisle at one end is the engine lathe department, so arranged that bar stock can be loaded into the screw machine tubes across the aisle and clearing between the lathes. At the other end across the aisle is a row of flat turret lathes which permit equally easy loading of bar stock without the wasting of any floor space on non-productive clearance room. This also places the turret lathes, which are used on especially accurate work, where the best light possible is available. Pipe stands with sheet steel shelves are used for gears, cams, etc., making it possible to have them convenient to machines and yet not obstructing aisles.

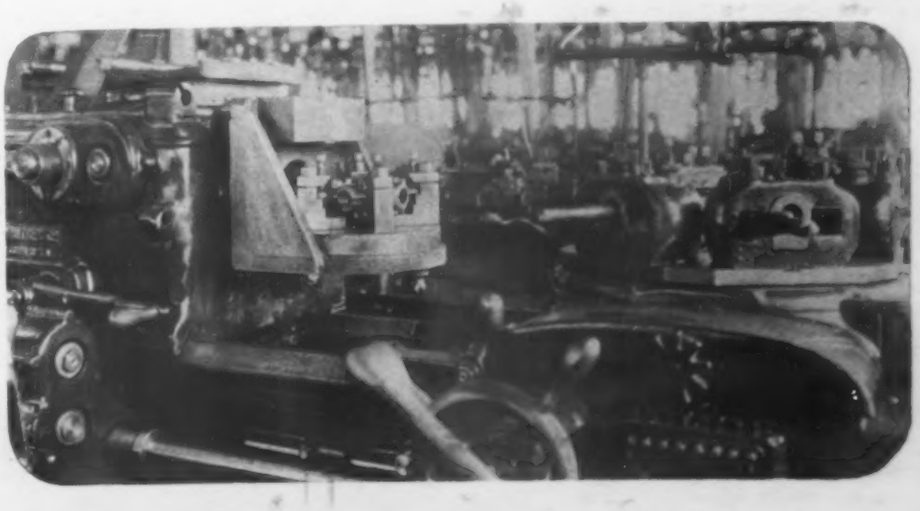
Particular attention has been paid to quality of threading operations. Ground taps are being extensively used, as they are found to produce better work and last longer. The company makes the nuts used in its product. These are tapped in a six-spindle tapping machine which, with ground taps, is run at twice the ordinary speed. Taps after threading 6000 to 8000 nuts show little appreciable wear calling for regrinding.

It has been found that certain threading operations

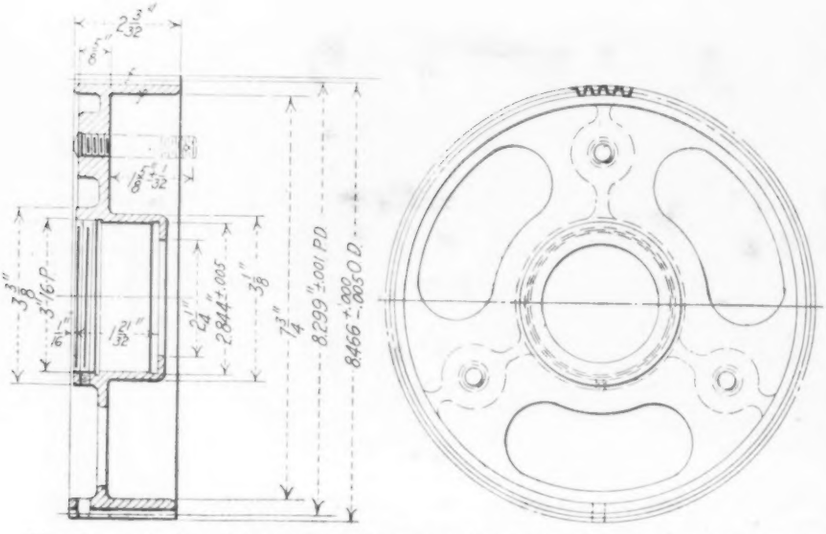


The Rear Axle Drive Shaft Bearing Retainer Is Finished Complete Except Drilling and Milling Notches, to Grinder Limits on the Floating Face Plate, in 1½ Hr. It must run within 0.002 in. all over when finished

can be more economically handled in a semi-automatic thread milling machine, even though this calls for a second chucking. A ring made of steel tubing finished



No. 6 A Counter Balanced Indexing Fixture Assures Alinement of Spider Holes. Counter bore is accurate to plus 0.000 in. minus 0.002 in. across faces



The Turret Lathe with Floating Face Plate Produces Retainer Clutch Disks to Close Limits Ready for Shaping of the Teeth

to 4⅞ in. outside diameter with 5/16-in. wall and ⅞ in. wide was formerly cut off in one machine and then finished complete, including a 16 pitch U. S. form thread ⅝ in. wide in a flat turret lathe. This piece is now turned in a 5½-in. automatic screw machine and then thread milled. The former time was 20 min., while the present time is 10 min.

Another piece with an internal thread 5⅝ in. diameter was formerly turned, formed, faced and threaded on a flat turret lathe. Now all operations except threading are done on the same machine. The thread 16 *P.U.S.F.* 1⅛ in. face is milled with a saving of 4 min. each over the old method. This piece has a tolerance limit of plus 0.001 in. and minus 0.000 in.

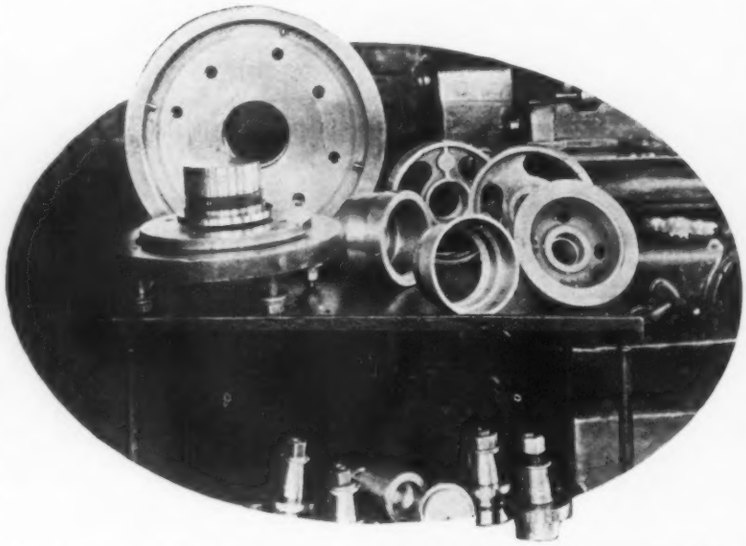
The steering worm adjusting sleeve guide is held to exceptionally close limits. On one external dimension the tolerance is plus 0.0005 in. minus 0.0000 in.; on the internal dimension it is plus 0.0000 in. minus 0.0005 in. This piece was formerly drilled and cut off from solid stock in a semi-automatic turret lathe and finished in a flat turret lathe. Total time for three chuckings was 30 min. This piece is now being made in an automatic screw machine from tubing and thread milled with tripled production, or 10 min. each.

An admission valve cap formerly made of malleable iron was turned and threaded outside in a flat turret lathe and bored and tapped in a second turret lathe operation, time being 9 min. and 7 min., respectively, or 16 min. It is now made from bar stock on a 3¼-in. single spindle automatic screw machine in 5 min. and thread milled outside and inside in 5 min., a total of 10 min., or a saving of 6 min. per piece.

Thread milling has also saved considerable in material formerly wasted. Nickel steel bevel pinion drive shafts after being machined all over require four threads of different diameters. According to the old method of threading stripped or torn threads would frequently spoil a piece, thus wasting not only the material but also losing all the work of preceding operations. This shaft is now being thread milled, doing away entirely with torn and stripped threads.

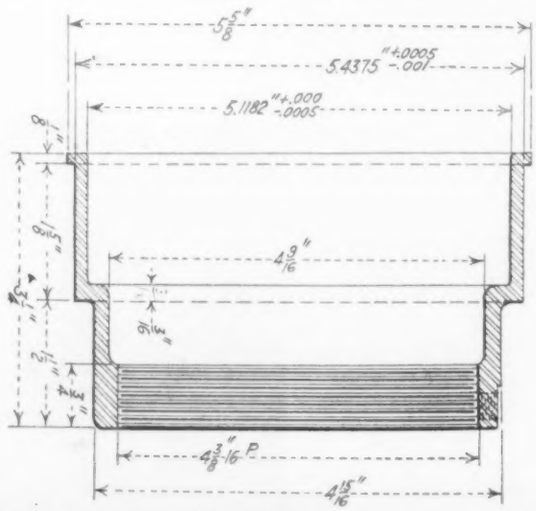
Many parts require close accuracy and fine finish for press fits. Much of this work is handled in flat turret lathes, being held on a specially designed floating face plate. The essential features of this fixture are a main plate, which screws to the spindle nose of the lathe, an auxiliary or floating plate and a variety of tapered nose pieces interchangeable in the plate, but made to carry various parts to be machined. A recess is cast in the main plate.

In the flange around the recess are four set screws. The bottom of the recess is relieved around the edge, leaving a raised portion in the center which serves as a backing for the auxiliary plate, which is bolted to it. Each time the fixture is turned onto the spindle nose a skimming cut of about 0.002 in. is taken over this raised portion to assure absolute truth. The auxiliary plate bearing the proper nose piece or plug is then set in place and centered by the set screws before being drawn up by the bolts going through the main plate. In centering the floating piece a dial indicator is used against the nose piece, which must run true to 0.0005 in.

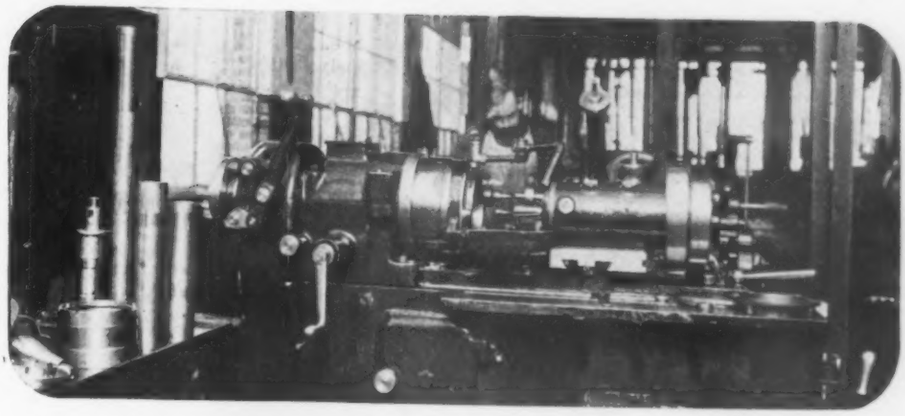


No. 4 Floating Face Plate Used on Flat Turret Lathes is Composed of Main Plate, Floating Plate and Nose Piece. The Work beside it is turned to close limits. On lower shelf are interchangeable nose pieces for various jobs

Much of the work handled in this manner is made from tubing, although some of it is cast. It is handled on a piece work basis, the floating face plate enabling the operator to secure accuracy and at the same time turn out enough work to make satisfactory wages.



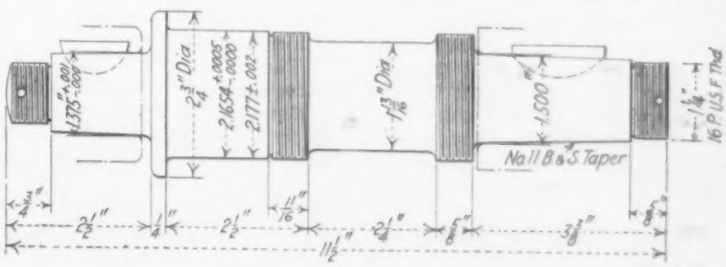
Rear Axle Bearing Retainer Made From Tubing Is Roughed Outside and Threaded in 18 Min. Outside and Race Seat Finished in 25 Min. Limits plus 0.0005 in. minus 0.001 in.



Milling Has Reduced Threading Costs and Wastage from Stripped Threads on a Variety of Work

Another fixture used on the flat turret lathes is an indexing angle face plate for boring, reaming, facing and counterboring the universal joint case or spider. This is made in two halves which are bolted together before the machining operation is started. The indexing fixture assures the parallel holes being in line and the others at right angles.

A relieving roller turner has been developed for automatic screw machines. Attached to the work spindle head and across to the turret head is a rack. With this meshes a pinion mounted on the turner and actuating the cutter adjusting screw through a friction. As the tool advances toward the work the gear turns the screw down, adjusting the cutter to proper position for the desired diameter. An arm attached to the screw and carrying half the friction device (the other half being in the pinion) strikes a stop screw set with a lock nut and prevents the screw from adjusting the cutter any farther. At this point the friction begins to slip as the pinion of course continues to travel on the rack. When the desired length is turned and the tool is withdrawn through action of the turret cam, the pinion swings the friction arm back against another stop screw and draws the cutter back, so that it does not drag back across the work with resultant scoring spirally as the turner is drawn back for the indexing position.

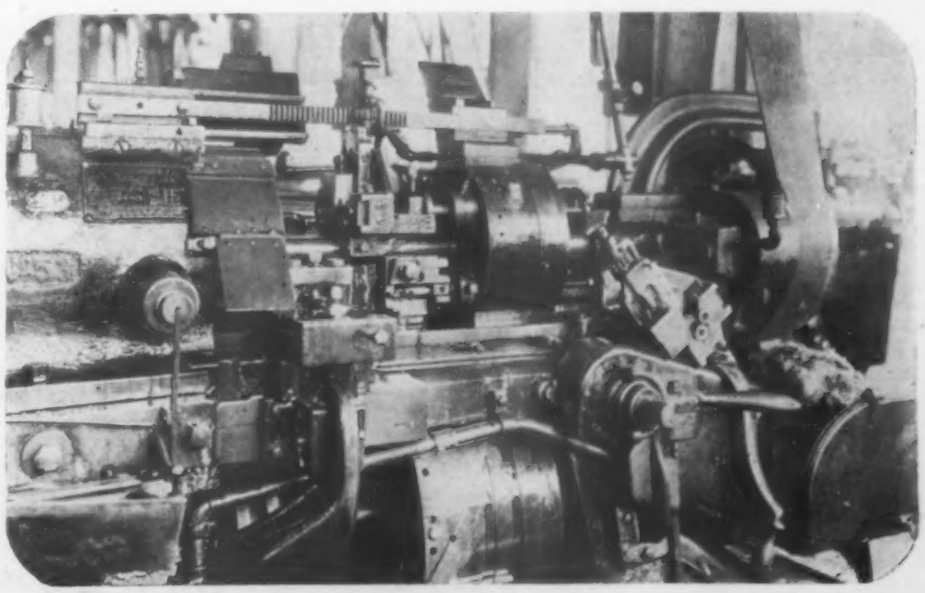


Thread Milling Saves Considerable Waste Formerly Involved Due to Stripped Threads on the Bevel Pinion Drive Shaft

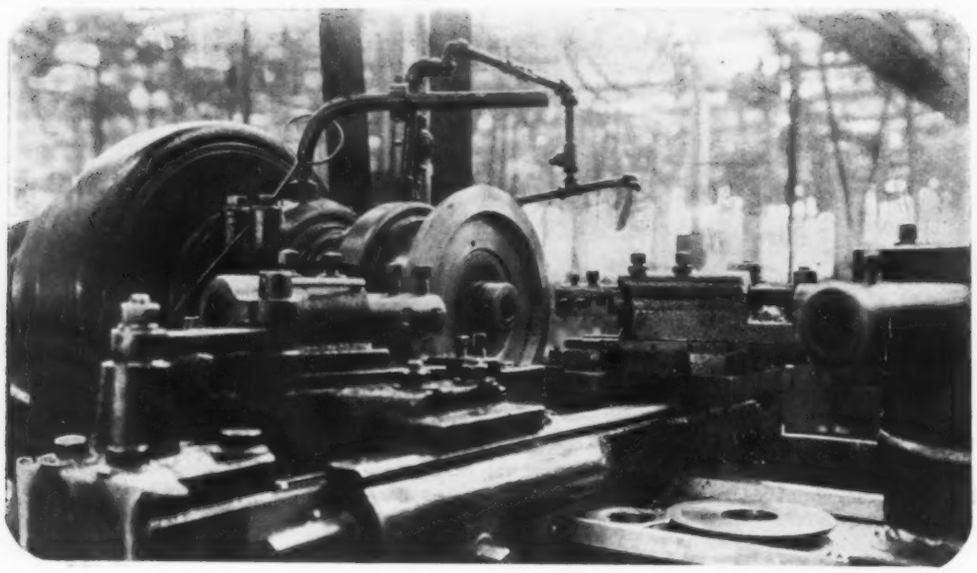
A vertical storage rack has been installed in the screw department which saves floor space in two ways. First the dead space required for actual storage is less; secondly no extra room is required to draw the stock out as would be necessary were the rack in a horizontal position. Also it is easy to tell at a glance just how much stock is in the rack, which would be impossible were the ends only of the bars exposed, not indicating the length. The rack is placed against the tool crib adjacent to the aisle. This tool crib is the central tool room for the production departments, all tools being stored there. A tool grinding department for grinding all tools is under the supervision of the tool crib head.

In common with other sections of the shop, the gear cutting department is laid out on the forward progressive idea, working from turret lathes and semi-automatic machines turning blanks, through the various gear cutting machines to the inspection division, without back tracking.

For turning the rear end bevel gear blank a semi-automatic turret lathe has been equipped with a specially designed mechanism. At the rear of the machine is a rack operated with a slowly reciprocating motion from the cam drum shaft. With this rack is meshed a pinion mounted on a splined shaft. This shaft extends parallel with the bed of the machine, entering a casting mounted across the ways in front of the head of the machine. This casting provides ways in which slides the actuating member for the



A Relieving Roller Box Turner Avoids Scoring Work on Withdrawal of Cutter, as the Rack Actuating the Pinion on the Screw Serves to Pull the Cutter Away from the Work



A Semi-Automatic Turret Lathe Has Been Specially Equipped to Turn Bevel Gear Blanks. This is a commercial machine with special slides and slide control

front turning tool. The motion is communicated through a rack and pinion, the latter mounted on the splined shaft at the rear. A link action conveys the motion to the actual tool holder, which slides in a secondary way at a fixed angle, corresponding with the angle desired on the bevel gear blank face. Two tools are carried, for roughing and turning in one pass. The rear slide for turning the beveled periphery of the blank is controlled in a similar manner, except that the motion is conveyed from the fixed member to the moving tool slide through a bell crank lever having a slot at one of the fulcrums to compensate for shortened centers during the stroke.

This company during the war purchased many machines with special features to accommodate them for war work. One of these was a gear hobber with a very large hole through the spindle instead of the regular hole which takes a taper arbor. To utilize this machine for standard production, it has been equipped with a vee type two-jaw chuck on the spindle nose and a special long over arm which carries an arbor support and center on its outer end. The work being done is splining drive shafts. The chuck grips close to the portion to be splined, the other end extending through the spindle and being supported on the center in the extra arbor support beyond the head of the machine.

The newly designed clutch contains disks made of a tough composition of asbestos. The serrations or gear teeth are cut in a gear shaper making them mesh properly with the malleable iron shell, the serrations in which are internal and also cut in the gear shaper. These parts in turn are uniform with the teeth or serrations cut in the retainer clutch disk described above in a turret lathe operation. Seven of the disks, which are ¼ in. thick, are cut at once 115 teeth 10 and 12 diametral pitch.

The company has built some special test benches. These consist of a cast iron bed with vee ways similar to a small lathe bed except much shorter. Each stands on three feet. On this bench is mounted a fixed block carrying an arbor of proper diameter to fit one of the gears being tested. On the vees is a movable block carrying a similar arbor. A vernier scale on the moving block and bed permits accurate setting for center distance between the arbors. The moving block is held in position by means of spring pressure which permits it to move under action of eccentricity. A micrometer screw is adjusted to bear against the indicator of a dial gage this registering the amount of eccentricity, if any is present.

Many other devices for saving time and labor are in use. A recent installation is a two spindle centering machine with spiral gripping chuck. It is saving at the rate of five times over the replaced machine. A centerless grinder has been installed for wrist pins, although due to the accuracy required this machine is permitted to turn out only about one-third of its actual capacity.

In assembling, extensive use is made of horses of various kinds. These are mostly made of short ends

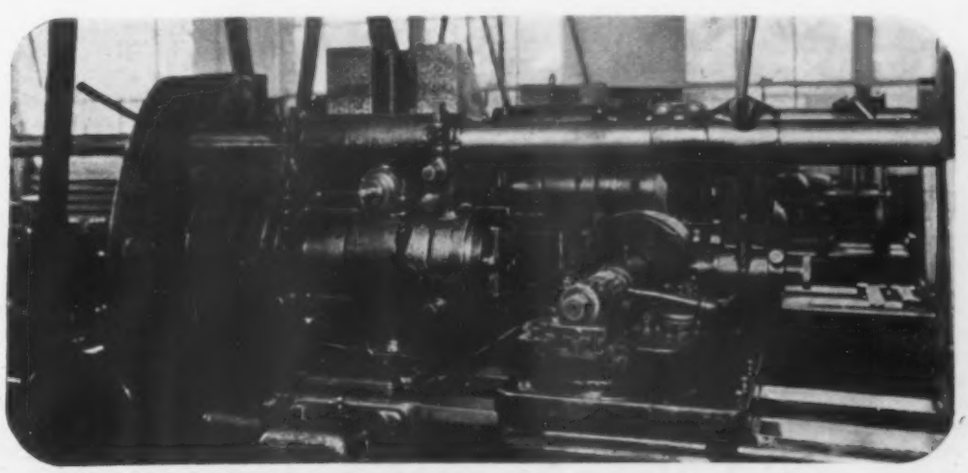
Serrations Cut in Asbestos Composition Disks Used in the Clutch and the Iron Shell (Shown in Middle Background) Fit Because Both Are Cut in Similar Manner

Vertical Storage of Screw Stock Saves Floor Space and Time of the Operator in Locating the Stock Wanted

of angle iron welded together and mounted on small wheels when portability is desired. Transmissions, for instance, are assembled on such horses and when completed are simply moved along a track to a drive shaft which is splined and hooks right into the universal joint on the transmission shaft. Here they are run in at high speed. Other sub-assemblies are handled in a similar manner. Motors are assembled in this way on an oval track with overhead monorail. Chassis are assembled on horses with the frames upside down for application of axles and are then turned over in a trunnion sling hung from an overhead trolley and replaced on the same horses which have tumbler dogs permitting the frame to rest on them, or when they are thrown back to be dropped to a lower bracket on the horse. As the chassis progresses along the assembly track, it finally reaches an incline. The wheels are attached and the chassis is run off the horses on its own wheels. The horses are returned on a monorail to the assembly starting position.

Employees of the Westinghouse Electric & Mfg. Co. will participate in the purchase of a new issue of 20,000 shares of common stock to be paid for on the deferred plan at $53 per share. Each employee may subscribe for one to 20 shares, to be paid for in ten consecutive monthly payments. When the final payment on each subscription is due, dividends at the declared rate and paid on common after Aug. 1 will be credited to the account of the subscriber.

Vernier and Dial Gage Permit Accurate Testing of Spur Gears (Bevel Gear Testing Machine in Background



The Gear Hobber Purchased for Special War Work Is Being Utilized on Standard Production. Hobbing Splined Shafts

to the account of the subscriber.

MANGANESE ORE SCARCITY

Post and Pre-War Production of Brazil, India and Russia—Small Supply Last Year

Sounding a warning of the possibility of a scarcity of manganese ore, the *Mining Journal*, London, England, in its issue of April 21, in an article entitled "The Danger of a Manganese Famine," discusses in considerable detail the world production of manganese ore in recent years and then takes up the three leading producing countries—India, Brazil and Russia.

India: The article shows that in 1922 exports of manganese ore from India were 774,860 tons, as compared with 710,856 in 1920, and 815,047 in 1913. It states that India is probably doing as much as possible at present, mainly because of the difficulties connected with railroad transportation. There are reports also that higher grade ores are becoming scarcer.

Brazil: Discussing Brazil, the article states that that country is the one which has shown the greatest progress as a producer of manganese ore since pre-war days, due of course to the demand from the United States steel industry. The statement is also made that some 18 months ago the United States Steel Corporation purchased the leading manganese mine in Minas Geraes, but has not worked it, preferring to fill its requirements from companies in the export trade. This policy is interpreted as clearly indicative of a conclusion that manganese ore may become scarce in the future. The article then gives details of exports for the years 1913 and 1919 to 1922.

Russia: In regard to Russia, the statement is made that before the war this country was the world's largest producer of manganese ore. Since the war, however, the exports of this commodity have become insignificant in comparison, despite reports of large exports during the past year. The figures given for exports in recent years compared with 1913 are as follows:

	Tons
1913	1,234,900
1918	33,000
1919	5,540
1920	180,000
1921	26,000
1922 (8 months)	150,000

According to the article, the Russian industry is heavily taxed. The Soviet Government participates in the export profits to the extent of 35 per cent. It also claims 10 per cent of the export ore at cost price 48 per cent basis. There is a customs duty of 2s. per ton on ordinary ore, and of 4s. per ton on peroxide, besides other charges aggregating about 13s. 6d. per ton. Thus, even if exports were forced this year from the estimated stocks of 830,000 tons, it is difficult to see how they can be maintained since developments can hardly be possible under such a system.

Total for 1913 and 1922 Compared

The article then summarizes in tabular form data for the three chief producers of manganese ore for 1913 and 1922 as follows:

	1913 Tons	1922 Tons
British India	815,047	774,860
Russia	1,234,900	200,000
Brazil	120,335	350,000
Total	2,170,282	1,324,860

The article closes with the following argument: "The disproportion between these two totals is serious, and although the iron and steel industry of the world is not yet up to the boom record of 1913 present indications, apart from catastrophic developments from the French action in the Ruhr or a possible coal strike in this country upon which it would not be safe for consumers to count, are that the leeway is being rapidly made up. It is sufficient for our argument if we take the recorded production in the last active period of the steel industry—1920. In that year the production was 68,000,000 tons in round figures as compared with 75,000,000 tons in 1913. At the present time production in the United States is on a record basis, which certainly points to an output of not less than 45,000,000 tons this year [50,000,000 tons now] as compared with 42,000,000 tons in 1920. The English output, also, for the last months is at a substantially higher rate than the average for 1913. Russia has, of course, practically dropped out, and the German production, while unknown, is certainly less than half that of 1913. Were the fuel position in France relieved, a certain amount of the German loss would be made good through the mere fact of the transference of territory, while, of course, Czecho-Slovakia and Poland benefit to some extent by the German losses. We can safely estimate a world production this year of 70,000,000 tons of steel, assuming always a normal continuation of the coal industry in this country and a settlement of the Ruhr trouble within a reasonable time. Under such circumstances, it must be clear that the diminution in manganese supplies is immensely greater than the shortage in the steel output, and at present there seems no clear expectation of our receiving any substantially increased output from the three chief producers."

State of Illinois to Fight "Pittsburgh Plus"

CHICAGO, June 18.—A bill condemning the Pittsburgh basing point practice and appropriating $25,000 to be used in the interest of its abolition has passed both houses of the Illinois Legislature and has been forwarded to the Governor for his signature. The act provides that the Governor shall appoint a commission of two senators and two representatives, one Democrat and one Republican from each house, a member of the American Farm Bureau Federation, a member of the Western Association of Rolled Steel Consumers and a manufacturer who is a consumer of rolled steel products. The act states that the commission shall have the duty and authority to protect the interests of the State of Illinois against "Pittsburgh plus."

Hearings in the Pittsburgh basing point case before the Federal Trade Commission will be held for two days this week at Detroit and will be resumed at Chicago on June 25.

Rate on Structural Steel Not Discriminatory

WASHINGTON, June 19.—In a tentative report submitted to the Insterstate Commerce Commission last week by Examiner Warren H. Wagner, he held that the rate of 17.5c. per 100 lb. on structural steel to New York from points in the Philadelphia district is not unjustly discriminatory or unduly prejudicial. The complainants consisted of the Alan Wood Iron & Steel Co. and other manufacturers in the Philadelphia district. The particular points of origin involved were Ivy Rock, Conshohocken, Pencoyd, Coatesville, Philadelphia and Phoenixville, Pa., and Wilmington, Del. These points are in the so-called rate group B, and while Bethlehem, Pa., is in this group geographically, it is not in it from a rate standpoint. The rate from Bethlehem is 14.5c.

Large Wage Distribution at Youngstown

YOUNGSTOWN, June 18.—The May wage disbursement here was $6,730,119. It was an increase of $674,667 over the previous month, and fell short but $142,000 from the big disbursement in January, 1921.

The May pay was at the annual rate of nearly $81,000,000. It brings the aggregate for the first five months to $30,241,940 as compared with $18,368,366 the corresponding period of 1922.

For the five-month period the disbursement was, therefore, at the annual rate of more than $72,000,000. The war peak wage disbursement was $95,000,000 for 12 months.

Total bank withdrawals in May were $60,191,194 comparing with $68,925,485 in April.

The General Motors Corporation sold an aggregate of 176,320 passenger cars and trucks during the first quarter of 1923, which is 105,289 in excess of sales made during the same period in 1922.

Interesting Facts About Sales Policies

General Managers of Sales Andrews and Clyde Testify in Basing Point Hearing at Pittsburgh—Immense Volume of the Record to Date

PITTSBURGH, June 18.—Hearing of witnesses called by the United States Steel Corporation, named as defendant in a complaint issued by the Federal Trade Commission in the Pittsburgh basing point controversy, begun here Wednesday, June 6, was concluded last Saturday noon. It will be resumed today in Detroit in room 402, Custom House, J. W. Bennett, examiner for the Federal Trade Commission, announced at the end of the Pittsburgh hearing. Following the Detroit hearing, there will be one in Chicago, to begin on Thursday or Friday of this week, since W. W. Corlett, counsel for the Steel Corporation, stated that he did not believe the hearing in Detroit would take more than a few days. Almost 18,000 typewritten pages of oral testimony and about 30,000 pages of exhibits had been taken up to the end of the Pittsburgh hearing, at which 30 witnesses, chiefly sales executives of independent steel companies in the Pittsburgh district, the Youngstown, central Ohio, Cleveland and Kentucky districts and of the Steel Corporation subsidiaries in Pittsburgh, were heard.

Examination of witnesses was along the lines of previous hearings, with the counsel for the Steel Corporation endeavoring to bring out that the Chicago district was unable to produce all the steel required in that district and that price variations were more common than a uniform price by all producers, while counsel for the commission sought to disprove these contentions. Outside of some interesting general information provided by Steel Corporation subsidiary sales managers, the last few days of the hearing here brought out little variation in the general character of the testimony from that given by previous witnesses.

Allocation of Tonnages

That working organizations had much to do with the allocation of tonnages among the mills of the American Sheet & Tin Plate Co. and that the company had been out of balance with regard to steel supplies for 10 years was the reason why sheets for shipment East were produced at the Gary, Ind., plant, were among the statements made by J. I. Andrews, general manager of sales of that company, who testified on Thursday, June 14.

Enlarging upon these assertions, Mr. Andrews, who was an interesting and frank witness, said that creation of working organizations at individual mills was not a simple matter and that the transfer of mill organizations from one plant to another had been found impractical, because of an inclination on the part of the men to drift back to the place from which they had been shipped. This was the case when the Gary plant was started; the men did not stay, even though they could earn more money through the wage bonuses paid to get men to go to a new mill town. Men have to be trained to do a certain thing and for the company to be able to make all kinds of sheets at all mills would necessarily mean constant training. That was the reason, he said, that the production of specialties was concentrated at a few mills.

The principal product of the Gary mills, Mr. Andrews stated, was blue annealed sheets; indeed, roughly about 67 per cent of the company's and between 35 and 40 per cent of the country's blue annealed sheet production come out of this plant. The bulk of these sheets is consumed in Michigan, Ohio, Indiana, Illinois and Pennsylvania, with Michigan usually leading because of the big demand from the automotive industry. Only open-hearth steel is produced at Gary, and the company normally is short of that kind of steel at plants dependent upon Pittsburgh district plants of the Steel Corporation for supplies. Automobile sheets are all of open-hearth steel, Bessemer steel failing to meet requirements because of its tendency to crystallize under vibration.

Why the Gary Plant Was Built

The Gary sheet plant was built for the purpose of supplying the West, witness stated, and with no thought of producing specialties. Plans for building a plant in the Eastern district similar to that at Gary to supply the automotive industry had been deferred several times in the past few years on account of the excessive cost of such a plant. The company had not kept pace with the expansion in the sheet industry, he said, in explanation for his statement that it now had only 24 per cent of the country's capacity. The American Sheet & Tin Plate Co. had 264 tin mills, or about 44 per cent of the country's total capacity and that of its own total, 48 were located at Gary.

Mr. Andrews said there had been no normal times in the sheet industry since 1916 and that in three of the last six years the company had been obliged to allocate its production of both sheets and tin plate; indeed, his principal function in recent years had been to allocate tonnages rather than market them in the ordinary way. The company until recently had sold to consumers and manufacturers for six months' periods and for three months to jobbers, the former providing about 90 per cent of the business. The company, he testified, does not reserve tonnages for open market sale; that orders are filled in turn and that the company never has asked or accepted a delivery premium price. He admitted in cross examination the necessity of being on a price parity with competitors to secure business in normal times and that the company had cut prices, even after having named a price for a period, to obtain a particular piece of business. The witness stated that over a period of years, prices of his company averaged higher than those of competitors and explained this by stating that large buyers were satisfied to pay more when assured that, barring accidents, they will get tonnages ordered and their orders will not be crowded off the books by premium business.

Competition in Blue Annealed Sheets

Another interesting statement by Mr. Andrews was that while the American Can Co. is the company's largest individual tin plate customer, it does not get the entire output of any one mill. He referred to the competition in blue annealed sheets which develops in lean times from independent plate mills, which will take business in material up to No. 12 gage. The reason the company recently named prices for third quarter only, instead of for six months, was because of the crowded order book and a desire, in view of the shortage of labor, to be able in the fourth quarter to make good any deficiency in the third quarter production. He declared the labor shortage was very severe in sheet and tin plate mills and that present operations of his company were only 79 or 80 per cent, as against practically full capacity production of ingots. He said the Steel Corporation today was short 25,000 men.

Want Delivered Price

On Wednesday, June 13, James Lippincott, president and general manager, West Leechburg Steel Co., Pittsburgh, testifying to conditions from 1888 to 1900, when he was with the Chartiers Iron & Steel Co., Mansfield (now Carnegie), Pa., and Kirkpatrick & Co., Ltd., Leechburg, Pa., said the common practice was to quote f.o.b. mill, but that some customers wanted a

delivered price and this was made by adding the actual freight to destination. Demand for a delivered price, witness stated, was made for the purpose of putting burden of safe delivery upon the mill. Customers got the benefit of railroad rebates in those days since the extent of the rebate was known and the net rate rather than the regular tariff was charged. Distribution of product of the West Leechburg Steel Co., witness testified, was largely from Detroit east. N. W. Leach, assistant sales manager, West Leechburg Steel Co., identified figures compiled from invoices, showing shipments into the Chicago district, admission of which was objected to by counsel for the Federal Trade Commission.

C. F. Mackey, general manager, Franklin Steel Co., Franklin, Pa., maker of rerolled rail bars and small shapes; M. A. Jones, assistant secretary, Mahoning Valley Steel Co., Niles, Ohio, and H. D. McKnight, traffic manager, Newton Steel Co., Newton Falls, Ohio, also were heard on Wednesday, the latter in connection with figures of shipments by his company into the Chicago district, compiled at the request of counsel for the Steel Corporation. Mr. Jones said that his company had taken black sheet business in recent months both above and below 3.85c., the base price of the American Sheet & Tin Plate Co., and also that his company occasionally shipped into Pittsburgh.

Steel for "The Fair"

George M. Hunter, operating manager in the Pittsburgh district, American Bridge Co., the first witness called on Thursday, June 14, asked why the steel for "The Fair," a Chicago department store, was fabricated at an Eastern, instead of a Chicago district shop of the company, replied that the Chicago operating manager had reported his inability to handle the job because the shops in his jurisdiction were crowded, and that he (Mr. Hunter) found he had enough steel from his regular monthly allotment to cover the job and that the Toledo shop was able to fabricate it. He said in cross examination that the shops in his district were allotted about 17,000 tons of steel a month by the Carnegie Steel Co.; that the allotment was based upon probable requirements and that his allotment about the time "The Fair" job was let exceeded requirements sufficiently to take this order, which involved about 2000 tons.

Roland J. Hadly, auditor, American Sheet & Tin Plate Co., identified figures of shipments by his company into the Chicago district and also amplified them and defined the Eastern and Western districts of the company. The Gary, Ind., sheet and tin plate mills constituted the Western district mills and the remainder, scattered through Ohio, Pennsylvania and West Virginia, were in the Eastern district. There was the usual objection by counsel for the commission to the admission of the shipment figures as evidence.

Charles A. Painter, now Pittsburgh manager, Fost & Flagg, investment brokers, but from 1886 to 1900, sales manager, J. Painter & Sons, plant of which firm now is the Painter mills, Carnegie Steel Co., testified that during his experience 75 to 85 per cent of the business was done on an f.o.b. Pittsburgh basis with freight added to destination, this because of the wish of manufacturers to avoid the burden of delivery. He said that his company had no competition in Pittsburgh from the Illinois Steel Co., and that it was able to dispose of about half of its production, amounting to 20,000 tons of bars annually in Chicago and west of Chicago. R. L. Twitchell, sales statistician, Carnegie Steel Co., followed Painter. He identified figures of shipments into the Chicago district by his company.

Mr. Clyde and Others Testify

W. Woodward Williams, sales manager, Pittsburgh Crucible Steel Co., Pittsburgh; Charles R. Cox, Pittsburgh Steel Co., Pittsburgh; W. J. Creighton, comptroller; Robert Geddis, manager of sales, hot-rolled department; E. D. Batchelor, manager of sales, wire department, and Philip Schaeffer, manager of sales, tin plate department, Jones & Laughlin Steel Corporation, were called on Friday, while Saturday's witnesses were J. D. Kessler, manager of order and shipping department, and William G. Clyde, vice-president and general manager of sales, Carnegie Steel Co. Examination of the latter was confined largely to plates, shapes and bars, in which he said his company had capacity for producing 1,500,000 tons, 900,000 tons, and 2,000,000 tons, respectively, annually. He detailed the sales organization, stating that the general manager of sales of the Illinois Steel Co. and the Tennessee Coal, Iron & Railroad Co., were also district managers of sales in their respective territories for the Carnegie Steel Co., but that he was not Pittsburgh district sales manager for those companies. He stated that prices were made by the president of the Steel Corporation in New York and then passed on to the district sales office through him; also that all inquiries were referred to bureaus under his jurisdiction before the sales were made. He testified to keeping informed as to market prices through sales managers and customers; that his company did not reserve tonnages for a rise in prices; that the company usually sold from three to six months ahead but that some contracts had run as long as three years, in which case, the price was declared on the tenth of the month preceding each quarter. Prices had been changed to meet market conditions, he stated.

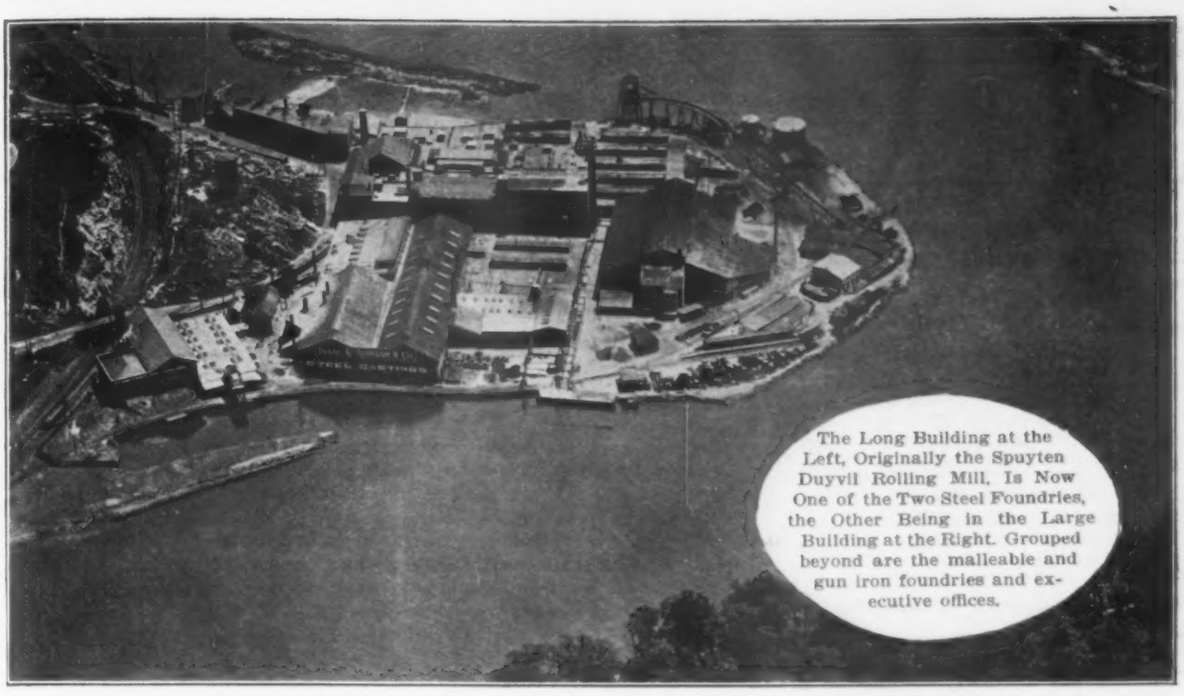
In cross examination Mr. Clyde said that the Steel Corporation reserved the right to place an order for steel at any mill it wished. This response was to an effort by counsel for the commission to bring out how Western district sales managers disposed of an order which might be rolled by either the Illinois Steel Co. or the Carnegie Steel Co. He said that when Chicago mills had a Chicago base approximating the Pittsburgh base Carnegie customers did not leave the company because of the freight advantage. The company never closed its order books so long as buyers, knowing mill conditions and willing to take shipments at mill convenience, wanted to place orders. He said that the business might be billed at a different price than the one prevailing at the time the order was entered. Witness stated that the Carnegie Steel Co. had an annual ingot capacity of about 10,000,000 tons and from that tonnage could produce about 7,500,000 tons of semi and finished products.

American Iron and Steel Institute Will Meet with Army Ordnance Association

As a result of the general approval expressed by the membership at the general meeting held in May, the board of directors of the American Iron and Steel Institute has accepted the invitation of the Army Ordnance Association to meet with it next fall at the Army Ordnance Proving Grounds, Aberdeen, Md. Consequently the next general meeting of the institute will be held at the Hotel Commodore, New York, on **Thursday**, Oct. 25, instead of **Friday**, Oct. 26, the regular date. Suitable train accommodations, leaving New York about midnight on Oct. 25 will be provided so that such members as so desire may reach Aberdeen on the following morning, Friday, and meet with the Army Ordnance Association, returning to New York or to other destinations that night.

This early notice of the general arrangement is given the membership at this time in order that they may plan to reserve the dates named. The usual formal notice of the meeting, giving exact details as to the meetings on both days and the details of the transportation arrangements will be sent the members early in October.

Clyde M. Carr, former president of Joseph T. Ryerson & Son, Chicago, whose recent death was announced in THE IRON AGE of June 14, made large bequests to music and art in his will, which has just been made public. The income from a $1,000,000 endowment is bequeathed to the Chicago Symphony Orchestra and the Art Institute of Chicago will receive an endowment of $500,000. Neither of the gifts, however, becomes effective until the death of Mr. Carr's widow.



The Long Building at the Left, Originally the Spuyten Duyvil Rolling Mill, Is Now One of the Two Steel Foundries, the Other Being in the Large Building at the Right. Grouped beyond are the malleable and gun iron foundries and executive offices.

Old New York Foundry at Spuyten Duyvil Closes

Isaac G. Johnson & Co., Makers of Steel and Malleable Castings, Retire from Business When State Condemns Land to Widen Harlem River Channel

WITH the closing June 30 of Isaac G. Johnson & Co. of Spuyten Duyvil, New York, will pass one of the landmarks of the steel industry in this country. Established about 1850 by Isaac G. Johnson, it is the only steel casting plant in the City of New York. Condemnation proceedings by the State of New York have been under way for some time and by a decision of the State Supreme Court on April 30, the peninsula occupied by the foundries, jutting out into the Harlem River at Spuyten Duyvil, was condemned for purpose of removal to widen the channel of the river as provided by Congress and the State Legislature.

About 1850, Elias Johnson, who for many years had been partner in the stove foundry of Johnson, Cox & Fuller, at Troy, N. Y., liquidated his interest in that firm, which became known as Fuller & Warren, and with his son Isaac came to New York, in search of a suitable site on which to establish an iron foundry. There were three available sites offered at prices ranging close to $1,000 an acre, among the three, the location of the company today. Of the other two sites, one was in what is now Central Park and the other at what is now Mott Haven. The first of these was considered good for residential purposes, for both the proprietors and the homes of workmen, but was too far from transportation facilities; the second afforded good water and rail transportation, but presented unsatisfactory residential possibilities, which were considered a necessary qualification then, when the proprietor and workmen generally resided in the neighborhood of the plant. It was the Spuyten Duyvil site that was selected, comprising about half of the 13-acre peninsula, now wholly occupied by the foundries. The remaining acreage was then owned by the Spuyten Duyvil Rolling Mill.

The first of the foundry buildings was erected and the production of gray iron, malleable and gun iron castings was begun. When the Civil War in 1861 necessitated the production of munitions, the foundries turned out cannon and shell for the United States. About 30 years ago, the remaining acreage of the peninsula was acquired by purchase of the old Spuyten Duyvil Rolling Mill, in which the first steel rail ever rolled in the United States is said to have been turned out from an English bloom for experimental purposes. At that time the plant was rerolling old iron rails and it was found that the mill used was not strong enough for operation on steel. Following its acquisition, Isaac G. Johnson remodeled the old rolling mill for a steel foundry as an addition to his already established iron and steel casting plant. Later additional buildings completed the present group of three malleable and gun iron foundries and two steel foundries.

It was after the Civil War that the company began making malleable pipe fittings, at one time ranking among the largest manufacturers of malleable fittings in the country. Still later the production of crucible steel castings was added and subsequently the old Terre-noire process was used for steel making. Twenty years ago the Tropenas tilting side-blown converter process was installed and recently an electric furnace. It is claimed that Isaac G. Johnson & Co. were the first to use successfully the Tropenas process for steel castings in the United States. Nearly 30 years ago, just prior to the Spanish-American War, they invented and developed to success the armor-piercing cap for projectiles. Isaac G. Johnson was the father of five sons, all of whom entered the business in youth, and all but one, Arthur G. Johnson, deceased, are still in control of the business, Elias M. Johnson being president; Isaac B. Johnson, vice-president; Gilbert H. Johnson, treasurer, and James W. Johnson, secretary. The only interest held outside the family is that of William F. Russell, who has been for the past three years managing director of the company.

For a number of years, the company was one of the few plants to successfully make the light castings used in the manufacture of automobiles and the reputation that it has borne for many years is for the successful production of small and intricate steel castings.

Ever since the cutting through of the ship canal that made of the Harlem River and Spuyten Duyvil Creek a waterway for traffic between the Hudson and the East Rivers, the possibility of condemnation has been present, but until recently was too uncertain to justify steps to seek a new site for the foundries. The decision of the Supreme Court on April 30 left too short a time to shift a company of such long-estab-

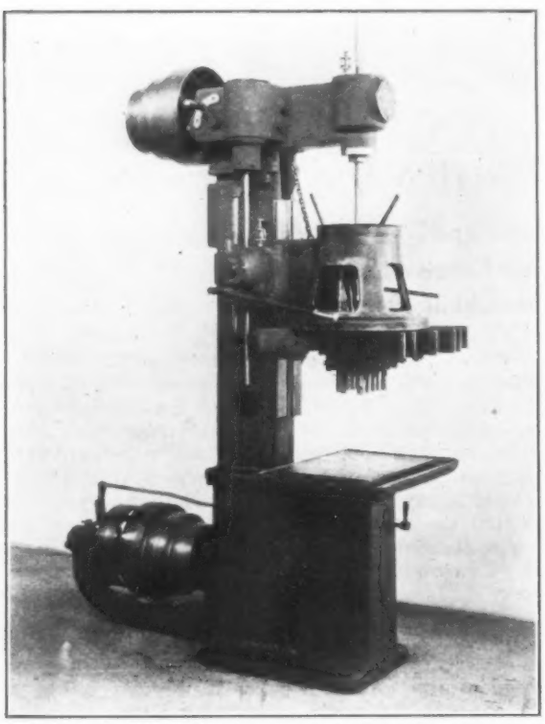
lished standing, transacting as it had for many years a considerable part of its business with users of castings either in the City of New York or within a radius of 50 miles; so, on June 9, the last heat of steel was made and the final castings to be turned out by Iasac G. Johnson & Co., are now being finished. Meanwhile, patterns of companies, some of which have been obtaining castings from the Spuyten Duyvil company for more than 40 years, are being returned to the owners and the plant is being prepared for release to the State of New York, July 1, for wrecking or whatever method of disposal is decided upon by the public authorities.

New Multiple Drilling Machine

The multiple drilling machine illustrated, designated as the No. 12-A and designed primarily for small high-speed drills, has been added to the line of the Fox Machine Co., Jackson, Mich.

The lower cone forms part of a countershaft which runs in Hyatt bearings and is driven by an Edgemont clutch controlled by the lever shown at the front of the machine. The face of the cone pulleys accommodates a 4-in. belt. The upper cone is carried on 1⅜-in. shaft, which is mounted on three ball bearings. A motor may be mounted on a special bracket in place of the lower cone pulley.

The yoke that carries the upper drive pulley also carries the feed gearing. Three changes of feed



Multiple Drilling Machine for Small High-Speed Drills. The head, 12 in. round, carries twelve ⅞-in. spindles

are provided by means of sliding cone gears, which transmit the power through a worm and worm gear to the vertical feed shaft. The worm and worm gear are submerged in oil, and the feed gearing dips in oil. The worm and worm gear, carried by the head, are always in mesh. A special clutch engages and disengages the feed by means of the lever at the left. The pilot wheel on the right raises and lowers the head through a rack and pinion. The vertical drive shaft is driven by ball bearing bevel gears at the front of the yoke.

The head illustrated is a 12-in. round, and carries twelve spindles ⅞ in. in diameter, which can be located at any point within the 12-in. circle. The head is counterbalanced, the weight being carried in the column. The spindles have vertical adjustment in the holding arms.

The base is of the pedestal type and the column is mounted on the base as shown. The machine has a driving capacity of 10 hp. The net weight is 3070 lb.

A 10 per cent wage increase, affecting 900 employees, has been put into effect by the United States Cartridge Co., Lowell, Mass., operative July 1.

New England Foundrymen's Association

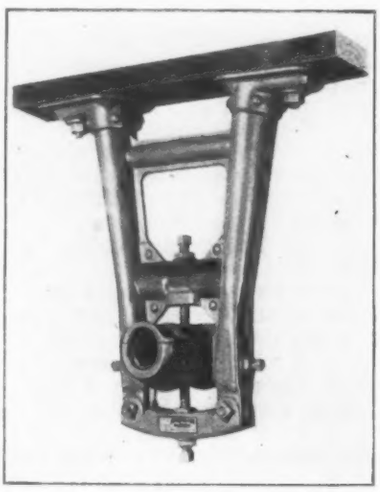
The New England Foundrymen's Association June meeting was held in Worcester, Mass., Wednesday, June 13, the association being the guest of the Worcester members. Assemblage was at the plant of the Arcade Malleable Iron Co., which, with other plants, was inspected by members. Following a buffet luncheon, various athletic games were enjoyed at a country club. In the evening a chicken dinner was served, at which George A. Ray, Taylor & Fenn, Hartford, Conn., president, presided. The guest of the evening was Pat Dwyer, engineering editor *Foundry*. H. P. Blumenauer, Arcade Malleable Iron Co., was chairman of the general outing committee, and Patrick W. Jordon, Reed Prentice Co., chairman of the entertainment committee. The July meeting of the association will be held in Providence, R. I., on the nineteenth, instead of the eleventh, as originally planned.

Pressed Steel Shafting Hanger

The shafting hanger illustrated, made entirely of pressed steel, has been placed on the market by the American Pulley Co., Philadelphia. It is of the four point set screw type, and has a swing yoke to permit the ready removal of the shaft or bearing.

The main frame of the hanger is made up of two stampings placed face to face, with inturned flanges extending the entire length of the leg, the flanges providing, it is claimed, unusual strength and rigidity. The cross brace is integral with the legs. Bolts, nuts and set screws are of standard dimensions and are accessibly placed. The foot of the hanger is of heavy cold drawn seamless steel and is attached to the oval frame leg by rivets, through its flange.

The hanger is available in 7 to 24 in. drops and



Pressed Steel Shafting Hanger. The main frame is made up of two stampings placed face to face, with inturned flanges extending the length of the leg. The cross brace is integral with the legs

for shaft sizes up to 3 in. Among the other features, the pleasing appearance of the hanger is emphasized by the makers.

The Kentucky Manufacturers' Association has projected a plan for a fusion with other associations, including retailers, which will be combined into one association to be known as the Associated Industries of Kentucky. The aim of the organization will be the safeguarding of the natural resources of the State through legislative action, conservation of a reasonable percentage of these resources for Kentucky industries, and the bringing to the notice of the world through publicity methods the wonderful opportunities offered to industries that locate in Kentucky because of its natural resources and its reasonable system of taxation.

When Does Scrap Come Back Into Use?

Survey of Our Potential Resources of Secondary Ferrous Material—Losses in Collection and Utilization —Modernization Vital Factor in Supply

BY WILLIAM CRAWFORD HIRSCH

IN this article the author considers in a unique manner the old-material industry about which little accurate information has been compiled. Taking as a basis the article published in the annual review number of THE IRON AGE, *on the distribution of steel, Mr. Hirsch considers how the steel so distributed comes back into use. Some surprising statements as to the life of various materials are made. Also some interesting facts, showing an intimate knowledge of the business, are presented. It is a timely story about* 100,000,000 *tons of steel handled in the past* 25 *years.*

IN the 50-year period from 1872 to 1921, iron ore taken from American mines aggregated, in round figures, 1,350,000,000 gross tons. Excess of imports over exports in that period added another 30,000,000 tons to the supply, which yielded approximately 700,000,000 gross tons of pig iron. Deducting from the latter tonnage 75,000,000 tons which represent approximately the excess of iron and steel exports over imports, 625,000,000 tons must be accounted for, if we are to have a clear picture of our scrap resources, which are the iron and steel industry's "second line of defense." How much of this huge tonnage, representing on the basis of present values about one-tenth of the national wealth, is now in gainful use, how much of it has fallen prey to oxidation, how much of it has been melted and remelted, with the losses incident to such re-utilization, how much of it has been wasted by failure to conserve it, and how much of it is now available for future use? These questions are easier to ask than to answer. There is no census of iron and steel in use, and when it comes to the tonnages that are retired from use in their fabricated form to return to cupola or furnace, the iron and steel industry, accustomed as it is to statistical records in most of its other activities, gropes in the dark, and this despite the fact that it depends for one-quarter of its ferrous raw material upon the efforts of the scrap iron collector—large and small. Save for the production of billet and bloom crops and kindred scrap by the mills themselves, the scrap supply is the "unknown quantity" of the iron and steel industry.

Mill Scrap Output

It would be relatively easy to collect and keep up-to-date statistics covering mill scrap output, although not all of it is re-used by the same mills which produce it, and some of it is added to the floating scrap supply. Individual mills may and undoubtedly do have records of the scrap produced by them, but even for this class of scrap data for the industry as a whole are lacking. In the scrap trade the tonnage of mill scrap production is estimated at approximately 25 per cent of the total ingot output. This corresponds with the general understanding of total scrap consumption which in a year with a 40,000,000-ton ingot production calls for 20,000,000 tons of scrap, of which 10,000,000 tons are mill scrap and the other 10,000,000 tons "outside" scrap. In "trade heats" ordinary charges used on a 100-ton furnace contain 95,000 lb. of scrap to 115,000 lb. of pig iron.*

Broadly speaking, it may be said that one-half of the scrap used by steel mills consists of their own and one-half of "outside" supplies. While mill scrap is not scrap in the sense of fabricated material that has been used and become useless in its original form, it shares to a proportionate extent responsibility for the progressive shrinkage in the country's resources of iron that has been sundered from the ore.

Oxidation losses incident to the reduction of pig iron to the higher forms of ferrous products furnish so broad a field for differences of opinion that computations are always of a relative character. There is a wide variance in oxidation losses in the different steel-making processes. Capt. Walter Graham, U. S. A.,** gives the range for Bessemer as 3 to 6 per cent. He considers an average of 3 per cent loss by oxidation, applied to the tonnage of steel output, as a conservative figure. The same authority states: "As the conversion of scrap into steel involves an oxidation loss of some 3 per cent, and since in the long run 95 per cent only of the steel is recovered as scrap, a persistent depletion of some 8 per cent occurs." Captain Graham's estimate of oxidation loss may well serve as a basis for mill scrap, but it must be borne in mind that an all-scrap charge of 100 tons would yield 97 tons, but not 97 tons of serviceable ingots. There would again be a certain percentage of mill scrap in the form of billet and bloom crops. It is this progressive loss through oxidation in the remelting of scrap which must be written off our iron inventory, even though every pound of scrap found its way back to furnace or cupola.

Certain kinds of scrap entail, however, melting losses running well up to 10 per cent, and when it comes to heavy cast scrap, re-melted amid conditions in keeping with high-grade foundry practice, the loss is frequently kept down as low as 2 per cent.

Gone, Never to Return

Next to oxidation losses incident to the re-utilization of scrap, there must be deducted from the supply of ferrous material that which has gone, never to return. No one knows how much iron and steel is in Davy Jones's locker, having been sent there in the form of vessels that once proudly sailed the seas, and to a smaller extent in the form of ballast and cargoes that were lost in marine disasters during the last 50 years. Much in the way of ferrous material, especially barbed wire, was rushed to our land and sea forces during the European War without appearing in our lists of exports. Little, if any, has come back to us.

Considered must be also the thousand-and-one iron and steel articles which, owing to their very character, can not be reclaimed by the scrap collector. Of these it is but necessary to point out pins and needles, pens and wire used in bookbinding, etc. During the intensive conservation period of the war, it was frequently stated that nothing in the way of iron and steel products should be permitted to go to waste, as all of it was useful for remelting. Obviously, however, there are some exceptions, at least under normal peace conditions. It would hardly pay any scrap collector to accumulate and grade such light materials as used bottle caps.

Not infrequently what scrap dealers know as "light iron" is a drug on the market, which means that it does not pay to collect it. If the scrap collector turns his back upon anything in the way of scrap offered to him, his apathy results usually in the re-

*"The Making, Shaping and Treating of Steel," Carnegie Steel Co., page 219.

**THE IRON AGE, July 28, 1921, page 188.

jected material being disposed of in such a manner that its return to furnace or cupola becomes doubtful. The assertion so frequently heard in scrap trade circles that all ferrous discard is certain to find its way back into re-utilization, even though it be thrown into the garbage can, is only partly true. Larger municipalities, of course, dispose of the ferrous refuse, among which tin cans predominate, in a rational manner, usually by contract to one of the tin reclaiming companies that look upon the ferrous material, after the tin has been recovered from the coating by a chemical process, as a by-product, suitable only for very light castings such as sash weights. There are, however, hundreds of small cities and villages where any ferrous material that is thrown into the garbage heap, unless it interests the local or itinerant junk man, is irretrievably lost. A certain percentage of the permanent iron loss is unquestionably to be charged to the fact that it either does not pay commercially to collect certain scrap or that the organization for collecting it is lacking.

Supplied by Industrial Users

Charles Dreifus, president of Charles Dreifus Co., Pittsburgh, one of the largest factors in the scrap iron market, in an address* last year before the National Association of Sheet and Tin Plate Manufacturers, said that of the 10,000,000 tons of scrap, other than mill scrap, required by the iron and steel industry in an average year, 4,000,000 tons were supplied by industrial users of iron and steel in the form of defective castings, burnt iron, borings and turnings, flashings and cuttings, etc. The scrap yards supply 3,500,000 tons collected from workshops, households and farms; and 2,500,000 tons a year come from the railroads.

The 4,000,000 tons supplied by industrial users of iron and steel fall virtually into the same category as mill scrap, the material resulting from sundry fabricating processes and being an inevitable concomitant of the manufacture of finished iron and steel products. This class of scrap returns into re-use within a relatively short time following the production of the primary material of which it was originally a constituent. Nor is there any appreciable tonnage loss in collection. Iron and steel consumers know the value of scrap. It is a valuable by-product to them and, as a rule, looked after with as much care as their finished product.

It is the 6,000,000 tons annually collected from workshops in the form of discarded machinery and mechanical accessories; from households in the form of pots, kettles, domestic machines, such as sewing and washing machines and, of late, the automobile of a by-gone vintage; and the scrap emanating from the railroads that constitute the real return on the iron that has gone from the mine into human service. The annual return is about 1 per cent of our iron output in the 50-year period from 1872 to 1921.

Life of Steel a Riddle

"The days of our years are threescore years and ten," says the psalmist, and then, because of the uncertainty of human life, adds: "and if by reason of strength they be fourscore years," but if the life of man is uncertain, the life of steel presents a riddle much more difficult to solve. Extension of experiments, such as those conducted by the American Society for Testing Materials on sheets which were exposed to the elements for a certain number of years, may lead to a positive determination of how loss in Fe is inflicted upon a steel of certain composition amid certain conditions of service, but even though such data were available for the widest range of steels and amid every conceivable sort of exposure and duty, they would not furnish an answer to the enigmatic problem of the mean time elapsed between the day when a steel product is first put into use and that on which it comes back as scrap to be rejuvenated by the cleansing heat of the furnace.

Approaching this problem, one is tempted to imagine that if a standard average loss through oxidation and abrasion could be estimated, the key to the sphinxlike puzzle would be at hand. A survey of the actual sources of scrap supply, however, quickly dispels this notion.

Replacement of obsolete machinery, modernization of industrial plants through the installation of labor-saving equipment, displacement of hand-propelled farm implements by those that are power-driven, the housewife's disinclination to use plain iron pots when enameled ware is all the go, the constant penchant for motor cars of a later model than the one in use, all of this never-ceasing surge of modern life, with its amazing responsiveness to everything that is better or perhaps only different but new, sends far more iron and steel to the scrap pile than all the wear and tear of the elements or industrial processes. Sociological changes are also reflected to a marked extent in the scrap supply. Adoption of the Eighteenth Amendment spelled a considerable accretion to scrap stocks by reason of the dismantling of breweries and distilleries. The horseshoer and farrier of yesteryear went to the scrap heap, together with large tonnages of ferrous material formerly used by him and the horse-driven vehicle industry in general.

On the basis of the excellent summary of steel distribution published in the 1923 annual review number of THE IRON AGE,† supplemented by information obtained in the trade and a survey of the scrap situation, it was possible to obtain a fairly comprehensive picture of the speed—perhaps it would be better to say the snail pace—at which scrap travels from the principal steel-consuming industries back to the furnace.

Railroads Most Methodical

Railroads, which take 22 per cent of the country's steel output, and which are credited with contributing approximately 25 per cent of the "old" scrap supply, are the most methodical among the scrap purveyors. In the first place, they sell nothing as scrap until it has become utterly impossible for re-utilization through repairs or reconditioning in their own shops. Then they conserve every piece of scrap as punctiliously as if it were new material, and grade it so as to obtain the highest possible market price.

The life of a steel rail in trunk line service ranges from 20 to 30 years, depending upon the aggregate loads hauled over it. The cause for the scrapping of rails, which constitute about 30 per cent of the railroads' steel consumption, is, however, almost always physical deformation and not organic decomposition. The "birth" of every section of rail is accurately recorded and, no matter how frequently a rail might be taken up and relaid elsewhere, its "vital statistics" are kept complete. When it is finally "scrapped," from the railroad's point of view, i.e., when it can no longer be used by that particular railroad, and is sold, it does not necessarily reach the country's scrap supply. It usually becomes a second-hand rail for relaying, is sold to a second-hand rail specialist, who disposes of it to an industrial user, such as plantation owners or logging enterprises. Latin-American sugar and coffee plantations are excellent outlets for these rails. Another ten years or more may elapse before they actually become melting scrap, especially as some, although relatively few, are rerolled into rails. Old iron rails still bob up here and there in the scrap trade. On the whole, it may be said that nearer to 30 than 25 years elapse between the time a steel rail is laid and when it returns as scrap, good only for melting.

The First Locomotive

Locomotives furnish a very good example of displacement by progress rather than by rust. The very first locomotive to run upon an American railroad, the "Stourbridge Lion,"†† which weighed about six tons, was displaced because of mechanical shortcomings, and from that time on the paramount cause for the displacement of locomotives has been the replacement with newer types of construction. Very few locomotives have worn themselves out, in so far as concerns their steel components. Still numbers find their way daily to the scrap heap, some, after having done

*THE IRON AGE, Aug. 31, 1922, page 533.

†"Where Steel Went in Nineteen Twenty-two," THE IRON AGE, Jan. 4, 1923, page 99.

††"The Manufacture of Iron in All Ages," Swank, page 348.

trunk line service, several years' duty on industrial sidings and secondary branch roads. When the life of a locomotive is placed at an average of 25 years, it is not meant that it wears itself out beyond repair in that time, but merely that the onward march of progress is such that in that period of time it is certain to become obsolete in type.

An extremely wide range must be set for the life of freight cars, not only because of the marked difference in wear and tear according to the use they are put to, but also because the dismantling of a freight car does not necessarily mean that the steel contained in it wanders to the scrap heap. In many cases after a freight car has become unserviceable as a rolling stock unit and patching up is out of the question, the bulk of plates, shapes, bars, nuts and bolts is reclaimed in such good shape that the scrap pile gets nothing. One wheel may be worthless for further use, the others in fairly good condition, and so with the axles. Freight cars built in the '80's of the last century are not yet a curiosity, and some of comparatively recent construction are frequently laid up for repairs. Refinements in construction and equipment will probably do more toward expediting the flow of freight and passenger car steel to the scrap pile than its actual wearing out.

Signal and sundry roadbed material, such as frogs and switches, show a somewhat diminishing mortality from former years. Railroad storekeepers are intensively reclaiming forgings, couplers, brakebeams and even wire. Most of this material is reconditioned in the railroads' own shops, but still the railroads continue to contribute their usual quota to the scrap supply, and for one reason only: Because obsolete material is systematically collected, sorted, and sold. The transportation industry considers itself the trustee of all ferrous material that goes into its equipment and it is safely returned to the country's furnaces.

Scrap from Buildings

Buildings and Construction, which consume 15 per cent of the steel output, furnish a negligible quantity of scrap. The use of structural shapes in building construction is barely 50 years old, and most of the so-called steel buildings of an earlier era, such as the old Stewart Building in New York, remain in original form. Some industrial plants containing steel, usually as reinforcing metal, are demolished from time to time, but on the whole the era when the industry can look for a scrap supply from the demolishment of obsolete "skyscrapers" is still rather far in the future. House "wreckers," moreover, strive to dispose of every bit of salvage for reconstruction purposes. Even builders' hardware coming out of dismantled buildings seldom finds its way to the scrap pile, and, as a rule, is resold to builders by the "wreckers." Steel bridges have a long life and when once in a decade some bridge is "scrapped," the work is apt to be far more spectacular than the yield of scrap quantitatively important. Sheets that have outlived their usefulness on roofs do come back as scrap, but this material is so light that it does not cut very much of a figure. When the Woolworth and Singer Buildings fall a prey to obsolescence, a steady flow of structural scrap may be looked for.

Worn Out Automobiles

Automotive consumption of steel, amounting to 10 per cent of the entire steel production, should furnish the speediest scrap returns, at least one would judge so from the fact that of the 3,000,000 passenger cars produced between 1899 and 1915, inclusive, few are ever seen on the highways and byways, and even of the 3,400,000 cars turned out in 1916 and 1917 representatives are very seldom encountered. The facts, however, deviate from the conclusion one is apt to reach on the basis of the utter invisibility of these five to 23-year old models. Most of these cars have been "broken up," it is true, but the scrap is very slow in filtering through the "wreckers'" yards into the actual avenues of scrap reclamation. Those who make a business of "breaking up" cars have their main eye to the salvaging of parts as such. They dissect the automobile with a view to recovering as much as possible in the way of the many mechanical units that go to make up the automotive whole, and for which there is a well established market for replacement purposes. Of course, automobiles that have been in collision or that have been otherwise smashed so that repairs are out of the question, always yield a large number of parts that are good for no other purpose than for scrap. It is surprising, however, how many engines of such cars are dispersed throughout second hand dealers' yards.

On the whole, those who "break up" cars are slow in disposing of even that part of the salvage which is nothing more than scrap, sales of material as "parts" being their goal. Away from the larger cities, where garage space is costly, many an automobile of ancient model is still conserved by the owner, not for service so much, although some cars too much out of date for pleasure vehicles are pressed into service on truck farms and for "dirty work" generally, but rather because of an idiosyncracy frequently in evidence and one that does much to retard the flow of scrap to the furnace, namely, a hesitancy to dispose of even that which is obviously useless, so long as it is not in the way or the space taken up by it not urgently needed. The heavier, especially the cast, parts of the lower priced passenger cars that have been retired from use, are now beginning to flow back to the scrap pile somewhat more regularly than formerly, but on the whole it would be a mistake to assume that, because the life of a low-priced passenger car is only a few years, its steel and other metal components will come back as scrap in so brief a time. Moreover, much of the steel that goes into automobiles is lost because, in many remote parts of the United States, the collection of steel-making scrap is unprofitable, the distance to scrap consuming and distributing centers being too great.

This, of course, applies equally to steel scrap other than that of automotive origin. There is this difference, however, that wherever population halfway warrants it, there is certain to be a junk collector who gathers what is known in the trade as "country mixed" scrap. This he ships to a larger dealer who grades it more thoroughly. Automobiles, however, have a way of "dying" in places remote from centers of population, and itinerant junk collectors are not equipped to break up cars for scrap purposes. Much steel that goes into automotive construction is, therefore, scattered so widely that it is virtually lost, and what does come back as scrap will be nearer traveling 10 to 15 years from the time it is put into automotive use until it returns as scrap than the few years that make up the short span of a car's use by the original purchaser.

Oil, Water, Gas and Mining

Oil, water, gas and mining consumption of steel, amounting to 10 per cent of the total output, is preponderatingly for extensions and only very slightly for replacements; hence, the scrap return from these sources is also meager. This is all the more so the case because very little pipe that is taken up ever finds its way directly to the scrap pile. It becomes second-hand pipe, and as such enjoys a long life following the original use it served. The life of pipe used for water and gas mains is a standing theme for the exchange of pleasantries between the makers of the various types, cast iron, wrought iron and steel, but as far as the time that elapses between the laying of any line of pipe and its actual scrapping goes, not even a worth while guess is possible. In some of the long oil transit lines, sections exposed to soil of an especially decomposing character call for relatively frequent replacement, but this pipe is still good enough for many purposes. So long as a piece of pipe is not actually full of holes, so long as it retains its tubular shape, some employment can still be found for it. Its return to scrap is exceedingly slow. Mine scrap—at least at the larger properties—is handled much the same as railroad scrap, and that having to do with drilling, crushing, grinding, vanning, etc., like industrial scrap generally, which is discussed under that head.

Back from the Farm

Agriculture, taking 4 per cent of the total steel output, has been and continues to be a large contributor to the scrap supply. The transformation of farm-

ing from an occupation in which man and beast wore themselves out by long hours of wearisome labor into an industry in which tractors, power reapers and binders, motor driven churns and mechanical implements in general play a dominant rôle is largely a development of the present century, and one that is still in progress. As a result, considerable tonnages of obsolete hand implements have been scrapped in the last 20 years, and much of this material continues to pass from farm to scrap collector and from the latter, through the intermediate stages of the scrap industry, to furnace and foundry. Improvements in the construction of farm machinery, with their correspondingly raised performance, make a strong appeal to the progressive farmer, who, amid normally prosperous conditions, is as quick as (if not quicker than) the manufacturer to substitute the better for the good. The farmer has also learned the proper methods of conserving scrap and of marketing it.

There is a wide leeway between the life of a reaper and binder as used on one farm and the same implements used on another farm. One kind of soil is harder on tilling and cultivating machinery than another. On the whole, however, steel passing into agriculture may be said to come back to the scrap heap within a score of years from the installation of the implements containing it, the marketing of new and improved types by the agricultural implement manufacturers having as much to do with the scrapping of the old tools as the wearing out of some of the latter.

Food containers, consuming 4 per cent of the country's steel production, come back as tin plate scrap within a few years after the tin plate has been rolled, some of them within a few months. As previously stated, they are valued chiefly, however, for the recovery of tin and not of steel, the uses of which latter scrap are limited by reason of the lightness of the material.

Other Sources

Industrial and Domestic.—Of the 28 per cent steel consumption which in THE IRON AGE'S tabulation is indicated by "all other," representative tonnage goes undoubtedly into machinery and mechanical equipment of industries a roster of which would fill a bulky tome. It is from these that the dominant tonnage of scrap is derived, a tonnage in the aggregate probably as great as that emanating from the railroads. From the thousands of Washington hand-presses, one of which was to be found in every country newspaper office half a century ago, to the large steam power plants with their myriads of stationary engines, boilers and thousands of feet of shafting and other transmission equipment, displaced by the individual motor drive, the scrap pile has drawn sustenance. The coming of automatic machinery has made useless, except for scrap, much of the country's mechanical equipment of a generation ago. A large part of this, as far as its condition was concerned, was as good on the day it was scrapped as on the day it was installed. Inventive progress and not usage nor the tooth of time sent it to the scrap heap. Investigation shows that very little in the way of mechanical equipment is being scrapped today because of its having worn itself out in service, but that very much is being scrapped because of labor and money saving improvements embodied in later models.

Ideas among those constantly in touch with machinery and machine tools on the length of their life in normal service are vague. When it comes to the number of years steel may be expected to withstand certain shock, stresses or impact in given mechanical operations, the best information obtainable is usually reference to some isolated instance of unusually long service which, however, cannot be taken as a generic criterion. "Forever, if the protective coat of paint is regularly renewed," is a stereotyped reply to the inquiry how long a stationary steel part of a mechanical unit should endure.

Dividing machinery into light and heavy, it may be stated, however, that a certain percentage of the latter does wear out in service, and it is this percentage which reaches the scrap pile much quicker than that which is displaced by more modern models. A manufacturer who finds that a machine has periodical breakdowns, making repairs too expensive in the long run, will scrap it or sell it to a scrap collector to be broken up by him. Machines in working order, however, that are displaced by improved types, are usually sold to a second-hand dealer, and a long time may elapse before they reach the scrap pile. Heavy machinery nearly always travels this circuitous route. Tool steel, especially high-speed cutting tools, have, of course, a well defined span of life under given duty performance, and such steels, being somewhat apart from the general run of scrap, pass into the hands of specialists in this sort of scrap whenever the accumulation is sufficient.

Some Queer Discoveries

There is a small plant in New York that was shut down for well-nigh 20 years. When it was reopened during the war boom, lathes built in the '80's were found to give good service. On the other hand, small machine tools installed during the war had to be scrapped after a very few years' use. Another factor must be taken into consideration. In many industries machinery is relatively a new thing. The baking industry 25 years ago had virtually no machinery. Today it is mechanically equipped throughout. How long will it be before this machinery is scrapped? No one knows, but, new as this machinery is, bread manufacturers (they are no longer bakers) will tell you that every year either a new kneading or mixing machine comes on the market, displacing the earlier types.

Domestic scrap, aside from pots and pans and tin cans, embraces such heavy scrap as furnaces, ranges and stoves. Then there is the wide miscellany of mechanical household contrivances running the gamut from the useful sewing machine and carpet sweeper to the ornamental phonograph motor. The greatest hindrance to the more speedy flow of this sort of scrap to furnace or cupola is the garret or store room where that which has become useless but which might "come in handy" some day rests until the sale of the house or removal makes disposal to the junkman imperative. Homes, however, are no exception in that respect. In the store rooms of hundreds of New York offices, where every foot commands a king's ransom as rental, repose typewriters and copying presses of a bygone day. But eventually, they no less than all discarded machinery of more massive type are gathered and added to the scrap pile.

An Old Industry

The re-utilization of scrap is probably as old as the iron and steel industry itself. "Old iron scraps" were worked up by the earliest New England forges, broken pots and kettles being converted into bar iron. The intensive utilization of scrap, however, set in with the coming of the Martin brothers' pig and scrap process, and developed more fully with the growth of the basic open-hearth process during the closing decade of the last century. Systematized collection of scrap on a national scale, as we know it today, can hardly be said to have begun before 1900. In a trade paper advertisement of the pioneer period of the scrap iron trade, a St. Louis firm of scrap dealers proclaimed: "Sales in 1905, $1,661,370.36. Nuff ced." That year was an excellent year in the steel industry, ingot production reaching 20,000,000 tons and the price of heavy melting steel scrap advancing to $17.75 a ton, Pittsburgh, after it had gone begging at $11 during the summer of the preceding year. But unquestionably scrap sales totaling $1,500,000 in one year were considered phenomenal in 1905. About 12 years later it was commonly understood in the trade that the sales of one large scrap operator had aggregated in one of the war years $60,000,000.

Certain it is that toward the 350,000,000 tons of basic open-hearth steel produced during the 25-year period from 1897 to 1921, the scrap collector contributed between 80,000,000 and 90,000,000 tons of raw material. Adding to this the scrap he furnished for other processes and to foundries, he may be said to have collected in that period 100,000,000 tons of scrap.

Of the 625,000,000 tons of 1872-1921 pig iron pro-

duction to be accounted for, a liberal percentage must be charged to *spurlos versenkt* account, whether resulting from irretrievable loss through physical impossibility of collecting the scrap or from the progressive impairment of iron (Fe) contents through oxidation in melting or by exposure to corrosion in the air.

The scrap trade, although it has functioned along modern lines not quite 25 years, can account for 100,000,000 tons, which is an economic achievement deserving commendation.

Fourth Sectional Meeting of American Society for Steel Treating

Eastern Chapters Discuss Impact Tests, Tool Steels and Other Subjects at Bethlehem, Pa.—Inspect Steel Plants

IF future sectional meetings of the American Society for Steel Treating are as well handled and as successful as the one held last week at Bethlehem, Pa., the plan of the directors of the national organization, inaugurated in the spring of 1922, will have proved to be a wise and profitable one. These sectional meetings, the first of which was held under the auspices of the New York Chapter in March, 1922, consist of one or two-day sessions at which a few technical papers are presented and discussed. They are held in various parts of the country so that the chapters in certain districts can have the advantage of more intimate contact with each other without the necessity of attending a national convention. Besides the first meeting in New York, there have been two other sectional gatherings, one with the Pittsburgh Chapter in June, 1922, and one with the Chicago Chapter in February, 1923.

The fourth sectional meeting was held under the auspices of the Lehigh Valley Chapter at Bethlehem, Pa., June 14 and 15. From every point of view it was probably the most successful one yet held. The program consisted of two technical sessions at which tool steel, case hardening, practical metallography, heat-resisting metals and impact tests were presented by competent authors. The sessions were exceedingly well attended and the papers were thoroughly discussed. The total registration approximated 150 members and guests, embracing metallurgists and steel treaters from many of the chapters located in the eastern part of the country, particularly New York and Philadelphia.

A feature of the meeting was an inspection trip through the plants of the Bethlehem Steel Co. The visitors were guests of the company at lunch in the main office building. On Thursday evening, June 14, a dinner and entertainment for members, guests and their ladies was held at the Hotel Bethlehem at which Dr. E. J. Cattell of Philadelphia was the principal speaker, with other entertainers contributing to the program.

The first of the two sessions was held on the afternoon of June 14 at the Hotel Bethlehem. After being called to order by A. P. Spooner, metallurgist Bethlehem Steel Co., and chairman of the Lehigh Valley Chapter, John J. Crowe, metallurgist Philadelphia Navy Yard, Philadelphia, and chairman of the Philadelphia Chapter, was named to assume the chairmanship of the meeting.

An address of welcome was delivered by Archibald Johnson, vice-president Bethlehem Steel Co., who in a most cordial and interesting address welcomed the steel treaters to Bethlehem. Mr. Johnson touched upon the strides which Bethlehem as a city has made in educational, civic and other matters. Ascribing this to the keen cooperative spirit which exists in that community, he declared that the American Society for Steel Treating as a whole owed its present and unusual success to the cooperative spirit which permeates the entire organization of both officers and members.

After a few appropriate remarks by the president of the national organization, T. D. Lynch, Westinghouse Electric & Mfg. Co., Pittsburgh, W. H. Eisenman, the national secretary, was called upon. He spoke of the growth of the organization, which now consists of 28 chapters, the last one having been organized recently at Los Angeles, Cal., with 50 members. He spoke of the prospects of three other chapters at San Francisco, Cal., Portland, Ore., and Seattle, Wash. He reported that the total membership of the organization was now at least 3000 and that $10,000 in the last year had been returned to the chapters. He indicated the possibility that $15,000 might be returned to the chapters in the present year. He ascribed the success of the organization as due largely to the condition of the various local chapters, some of which have a bank balance of close to $2,000. In strong contrast to these statements he cited the fact that four years ago the organization started with one chapter of only 200 members and very little money. Discussing the national convention and exposition to be held in Pittsburgh the second week in October, Mr. Eisenman stated that already space had been engaged for the exposition, 20 per cent in excess of that sold for Detroit, and that papers had already been assured from such well known contributors as Messrs. Hondi, Portevin, Jeffries, Langenberg, Baine and others.

The Technical Papers

The technical program consisted of five papers which covered a wide variety of subjects. Three of these were presented on the afternoon of the first day, Thursday, June 14, and the other two on the afternoon of the second day, Friday, June 15. The first session was held at the Hotel Bethlehem, at which there was an unusually large attendance, considering the scope of the meeting.

Some Impact Tests on Steel

One of the most interesting papers was entitled "Behavior of Metals Under Normal and Sub-Normal Temperatures" by Dr. F. C. Langenberg, chief metallurgist Watertown Arsenal, Watertown, Mass. A feature of this paper, as well as the other two at this session, was the large number of lantern slides presented. The author spoke entirely without manuscript and discussed results of a large number of experiments conducted at his laboratories dealing with the significance of certain impact tests on forged steel of various compositions.

Indicating that for some time there has been a difference of opinion as to the significance of impact tests, Doctor Langenberg stated that, to understand the difference between impact and tension tests, it would be necessary to plot the stress strain curves of tension tests in order to compare the work done with the work involved in impact tests.

One of the causes which led to the investigation was the knowledge that in service certain steels seem to give erratic results, depending upon the temperature at which they were used; that in airplanes some steels fail at the low temperatures at high altitudes that do not fail under more normal temperature conditions and that, even at certain variations in room temperatures, unusual failures have been detected in steels that were uniform and suitable as a basis for careful comparison. He also cited the case of ordnance guns where the steel is subjected to strains at temperatures as high as 100 to 110 deg. Fahr.

The machine which the author used in his results was the Charpy, adopting of course the usual notched test bar. An ingenious modification of this bar was described by the author which was devised to determine

the temperature at which the bar was broken. Temperatures as low as 60 to 80 deg. below zero deg. Fahr. were used, the temperature of the bar being determined by inserting a thermometer or a thermo couple into a hole drilled into a test bar alongside of which were the bars to be tested. In this way a fairly comparable system of checking the temperatures and the tests at these temperatures was possible.

The various steels used were of five different kinds, including the nickel steel used in ordnance work, plain low carbon steel, and one or two other familiar brands. Two methods of heating treatment were applied to the steel. One was simple annealing and the other was a quench and draw treatment. A large number of charts were shown on which were plotted the results in foot-pounds of the Charpy tests on the various grades of steel annealed and heat treated. It was shown that in certain grades of steel, the resistance to impact from zero to 80 deg. Fahr. was as low as 20 ft.-lb. and that at 100 deg. Fahr., the resistance to impact suddenly increased, running up in some cases as high as 200 to 300 ft.-lb. and higher. This was true usually in the case of annealed steels. In the case of the same steels quenched and drawn, the author showed that the tendency was to shift the curve backward or to cause the increased resistance to impact to develop at a temperature considerably lower than in the case of the annealed steel.

The author also showed that, in the case of alloy steels, the results were considerably different, although the same general rule applied. As a general proposition, the resistance to impact was greater at the lower temperatures for the heat-treated material than for the annealed.

In discussing this paper, John H. Nelson, research engineer and metallurgist, Wyman & Gordon Co., Worcester, Mass., stated that Dr. Langenberg's data and those made at his own laboratories were not comparable. In his own tests, the Izod machine was used in which the specimen is much smaller and in which the registered foot-pounds are much less. Therefore, a discussion of the foot-pound involved in the two cases would have no meaning.

In his own results, Mr. Nelson said that some grades of crank shaft steel, which are mostly chrome-nickel, gave 3 to 4 ft.-lb. resistance, and that at lower temperatures they did not give much less. He stated that his tests showed wide variations depending on the process used in manufacturing the steel, so much so that while acid open-hearth gave poor results, basic open-hearth of the same grade gave good values and that apparently mistreating the steel did not harm it so far as impact results were concerned. In an attempt to classify the output of some mills, Mr. Nelson said that on 0.40 to 0.50 per cent carbon steels the impact results in some cases were not less than 10 ft.-lb., whereas in others it was 10 ft.-lb. and less, while in other products the results ran up to 30 ft.-lb. These variations he thought might be due to melting practice.

Strains in Tool Steels

A contribution to the subject of tool steel was presented by F. R. Palmer, Carpenter Steel Co., Reading, Pa. He took as his subject "Equalization of Internal and External Strains in Tool Steel." This paper also was delivered extemporaneously and well illustrated. The author enunciated the general principle that when the total of internal strains in a tool steel exceeds the strength of the steel, cracks and defects develop. He supplemented this with the statement that the three important factors in tool steel are the analysis, the quality and the heat treatment. The author discussed very fully six different stages in the manufacture and treatment of tool steels which bear upon the quality of the product, taking up first the analysis of the steel, then the design of the tool, then the effect of machining, followed by a discussion of the rôle of the hardener. The effects of drawing and of grinding were also minutely dealt with.

In discussing the hardening of tool steels, Mr. Palmer laid emphasis upon the present tendency to exercise insufficient care in heating the steel just above the critical point. Unless the steels at this juncture are allowed to be thoroughly heated through, there are often zones in which the proper transformations have not taken place and failures result, due to the setting up of unnecessary strains.

Case-Hardening Compounds

A thorough discussion and comparison of the various case-hardening compounds at present on the market was discussed by B. F. Shepherd, Ingersoll-Rand Co., Phillipsburg, N. J., in a paper entitled "Case Hardening" which the author read and which was illustrated with lantern slides. The author fully discussed the various effects of the different brands and laid stress upon the necessity of thermal conductivity as an essential quality in any compound. The use of both solid and liquid case-hardening materials was taken up and the author advocated the use of other steels in place of case-hardened materials whenever it was possible.

More or less informal discussion followed this paper, which dealt with the dangers from the use of cyanide in case hardening as compared with the use of Shiroc. There being considerable difference as to the harm from the use of the former compound, a resolution was adopted urging the national officers to appoint an active committee which should investigate the subject and make a report as to the occasional harm which the use of cyanide involves.

The Session at Lehigh University

The second session was held in Drown Hall, Lehigh University, Friday afternoon, June 15. Samuel Tour, metallurgist, Doehler Die Casting Co., Brooklyn, and chairman of the New York Chapter, was appointed chairman. He called on Dr. C. R. Richards, president of Lehigh University, who, in extending the greetings of the university to the society, emphasized the fact that Lehigh is particularly interested in this new type of organization, devoted to the study of materials, their structure, and how this may be changed. He mentioned the activities years ago of Doctor Frazier and Dr. Joseph W. Richards in developing metallurgical work at Lehigh University before the structure of iron and steel were as well understood as they have been in recent times. One of the tests under Doctor Richards was cited. This was conducted about five years ago in order to study the capacity of high-speed steel as used in drilling. Cast iron blocks were used as test pieces, about eight tons being cast from one heat to assure uniformity in the blocks. In this test a 1-in. drill was used, which drilled at the rate of 60 in. per min. This increased the respect for high-speed steel tools. Alluding to the engagement of Bradley Stoughton as the new professor of metallurgical engineering at Lehigh University, President Richards said that it was expected that development along those lines would continue. "The plans include," said Dr. Richards, "the establishment of the Lehigh Institute of Research to solve problems of fundamental importance. This would be in line with the research bureau of the University of Illinois, established by the help of contributions from various sources, for the investigation of properties of iron, steel and non-ferrous metals. The work of the Institute at Lehigh would be to assist engineers and industries in the East."

Practical Metallography

An address by R. H. Christ, of the Bethlehem Steel Co., on "Practical Metallography" followed the greeting by Doctor Richards. Mr. Christ introduced his subject by saying that all manufacturers strive to improve their products. Probably one of the most recent means to this end is metallography. The microscope, he stated, was first used in the steel industry in 1880. Through its use and the use of photomicrographs it is possible to study the physical condition of elements and compounds.

The tendency today, the speaker said, is to heat insufficiently high above the critical point so that a thorough solution is not obtained. Soaking or holding at the lower temperature for a time would produce the

(*Concluded on page* 1829)

New Furnace for Malleable Castings

A Small Open-Hearth Furnace Developed in Switzerland to Make Thin-Walled and Complicated Castings—Unusually High Temperature Used

BY DR. ALFRED GRADENWITZ*

SO far from being a substitute for processes already in use—particularly small Bessemer converters and electric steel furnaces—the new hearth furnace designed by Edwin Bosshardt, a Swiss engineer, is mainly intended to manufacture an especially soft and liquid product, suitable for complicated, bulky and thin-walled castings. In kind and quantity of products, it will fill in a gap that so far has existed between the crucible and open-hearth furnaces, the weight of each charge being 2000 kg. (2 tons).

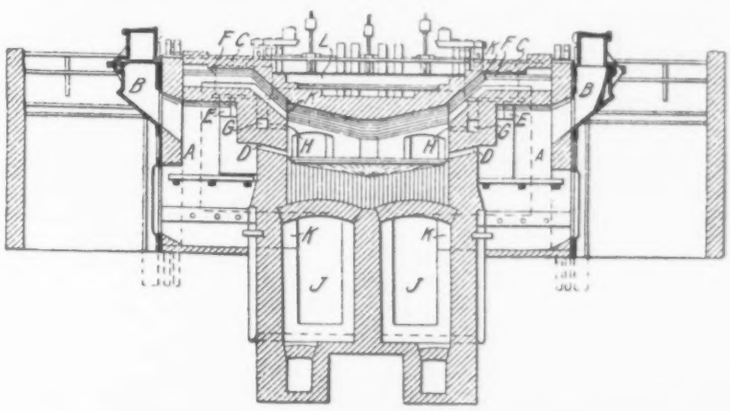
As the wrought iron and ingot iron waste available in machine shops is mainly used as the charge material, the furnace will be used to advantage not only by steel foundries manufacturing special castings such as those referred to, but by machine shops having sufficient amounts of scrap at their disposal and wishing to manufacture at the premises high-grade steel castings required for private consumption, from a minimum weight of, say, 40 grams (1½ oz.) up to about 1500 kg. (1½ tons). At the same time, the furnace is well suited for the manufacture of hard or soft small ingots. In fact, it may be said to extend the range of applications open to steel castings.

Fig. 1 is a longitudinal section through the Bosshardt furnace. Two gas producers *A* charged by the loading hoppers *B* are, by the two furnace heads *C*, connected immediately with the furnace. An essential feature is the arrangement of a slot *D* at the level of the white hot zone of the gas producers, in the masonry of the furnace heads. Narrow flames are allowed to pass through this slot from the gas producer into the furnace, thus effecting an early ignition of the gas and a very high temperature in the furnace.

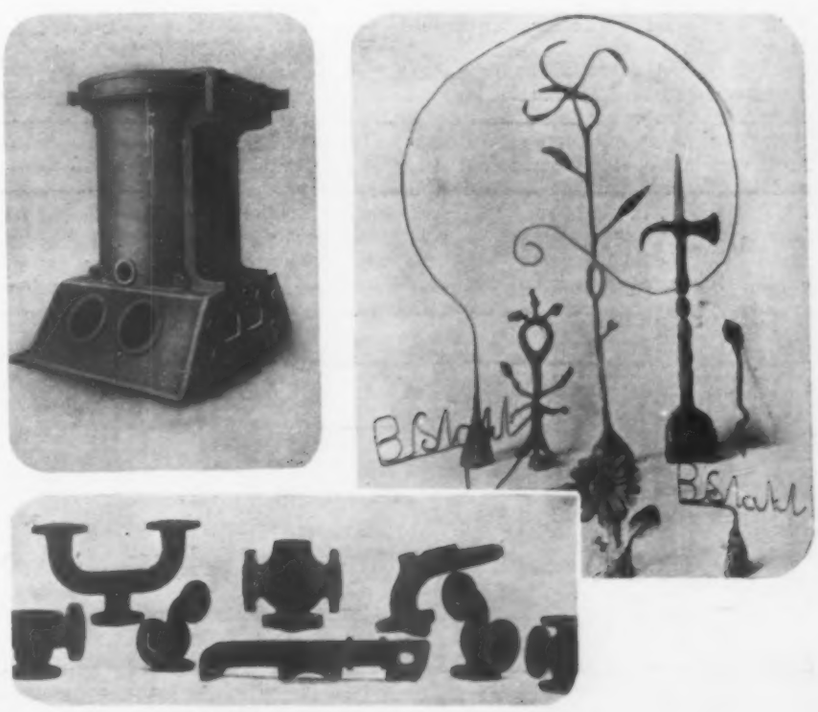
Gas generated in the producers penetrates through conduits *E* into the regulating cases *F* and thence, after passing through the preheater conduits *G*, provided in the furnace heads, through gas slots *H* into the furnace. Thanks to this arrangement of the conduits, the compartments otherwise used for heating the gas are completely done away with. The air is—exactly as in the case of ordinary open-hearth furnaces—preheated in regenerator compartment *J*, whence through a conduit *K* it enters the furnace and, in this connection, mixes with the gases escaping from a lower level.

When switching over the air supply from one side to the other, by means of a reversing drum, the gas should, of course, also be switched over. That is to say, one of the producers should be switched out and the other switched in, to accomplish which each regulating case contains a valve. To enable the producer switched out to be kept in operation and generating gas, connecting tubes *L* are provided between the regulating boxes of the two producers, facing one another, so that the gas generated by the producer switched off may pass over to the regulating case of the other producer, and thence into the furnace.

Inasmuch as the white heat of the gas producer,



AT Left Is a Longitudinal Section of the special Form of Furnace Used in Producing Malleable Castings. Some of the common forms of castings made of metal from this furnace are shown below. The group at the right indicates the extreme malleability of the metal, each of the pieces having been hammered or drawn out of castings from the furnace described



*Berlin-Friedenau, Germany.

together with some heated fresh air and the gas generated in the producer, are introduced into the melting compartment in such a way as completely to surround the incoming gas with a broad layer of hot air and the narrow flame entering from the white heat range of the producer, so that the gas is ignited and burnt most rapidly, an extremely high melting temperature is produced in the melting compartment, thus resulting in an unusually pure product, containing very little carbon and, accordingly, being remarkably tough. Temperatures upward of 2000 deg. Cent. (3622 deg. Fahr.) are produced by means of this furnace, thus enabling the very hardest charge material, such as rail sections, old fishplates, rivets, sheet metal waste, boiler sheets, wrought iron waste, etc., to be decarburized down to fractions of 1 per cent of carbon. The finished product has a tensile strength of 36 to 45 kg. per sq. mm. (58,000 to 72,000 lb. per sq. in.) and an elongation of 20 to 30 per cent.

Inasmuch as the steel bath in the Bosshardt furnace is intensely preheated, the precipitation of ferrous oxide and, accordingly, the production of carbon oxide, is prevented, thus reducing the risk of producing blister castings to a minimum. It is, accordingly, possible to cast from a plug ladle of about 2000 kg. (2 tons) capacity 50 to 60 molds in succession, without risk of freezing the stopper. A mixture of about 75 per cent scrap iron, 20 per cent pig iron and the usual additions is the most suitable charge, though even in the absence of pig iron, merely by the addition of carbon, highly satisfactory results can be obtained. From two to three hours (according to the degree of decarburization desired) are the usual time for dealing with a charge.

As the furnace has a basic lining, it not only decarburizes but dephosphorizes the charge, which is of particular importance in connection with inferior scrap. The coal consumption in the case of three operations per day is about 100 per cent of the steel ready for casting. As the furnace in this case, however, is far from being utilized to its full capacity, the fuel consumption may be reduced later to 50 or 60 per cent of this figure.

The life of the furnace masonry is satisfactory in spite of the high temperature attained in the Bosshardt furnace. This is due to the arrangement of furnace heads by which the flame is thrown on the charge with considerable force, while leaving the roof less exposed to the direct impact of the flame.

Tests recently made have shown both crucible and open-hearth qualities to be obtained by means of the new furnace. On account of the great strength and considerable elongation of these steel castings, they will in many cases be used as a substitute for bronze as well as for complicated forgings.

Practice on Recuperative Annealing Furnaces

Pot Furnace Designed to Act as a Simple Producer—High Economy Claimed Compared with Oil-Fired Apparatus

BY KARL G. GUSTAFSSON

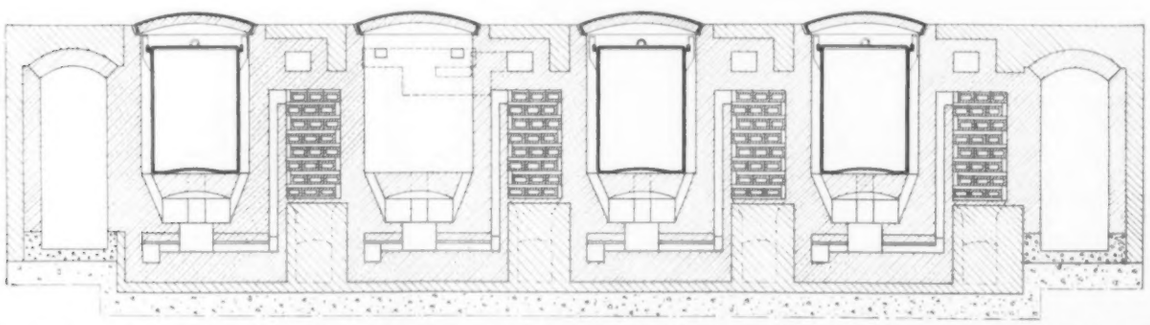
SCARCITY of fuel during the war in Europe caused the development of a new modification of the producer gas fired furnace, which has been applied in several branches of the iron and steel industry. As is well known, generating of gas from solid fuels is generally connected with about 30 per cent loss of the heat value of the fuel. But, when the generated gas is burned with air efficiently preheated by the escaping waste gases, not only is that loss recovered, but a considerable further saving in fuel results, and there are numerous cases where the recuperative producer gas fired furnace establishes a more favorable efficiency than the stoker fired. And the recuperative installation is adopted where blast furnace or coke oven gas is available.

A modified furnace has been developed, with one or more fire boxes of simple design and a certain inside height, in order to constitute a kind of plain producer, one or more recuperators transmitting the heat in the escaping stack gases to the air of combustion, and thus regaining that heat for the thermal process brought about in the furnace. The following description of a wire annealing installation operating according to this combustion principle will more completely explain the furnace design.

The description covers a pot furnace handling bright annealing of 835 tons of steel wire monthly. Four vertical cylindrical chambers, each constituting a receptacle for a pot, and two deep fire boxes, were built in a straight line, the whole being one masonry block with straight external sides, and held together by a binding of I-beams, channels and round tie rods.

The two fire boxes, each 3 ft. wide, 4 ft. 9 in. deep and 8 ft. high, were placed one at each end of the furnace block, and had, 15 in. above their bottoms, a simple cast iron grating, below which the walls and the bottom of the fire box were made by watertight, slightly reinforced concrete, thus forming a basin for water. Inside height of the fire boxes above the grate bars was about 6 ft. 9 in. Underneath the cylindrical pot chambers, and a few feet offset from their center line, was a flue with about 2 sq. ft. cross section, connecting the upper parts of the two fire boxes. The purpose of this flue was to conduct the producer gas from the fire boxes to the burners, of which there was one underneath each pot chamber.

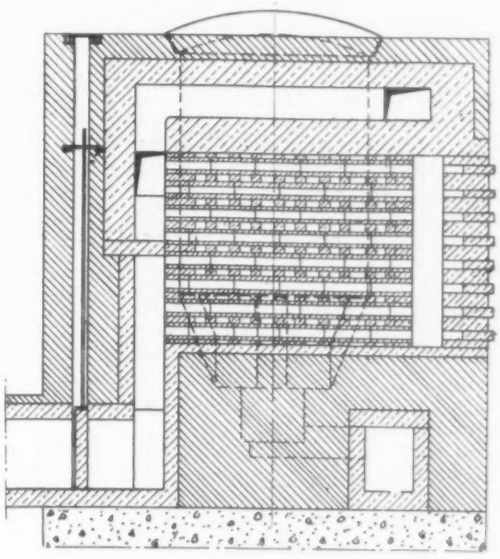
Those burners are simple, each just a space about 18 in. square by 15 in. high, being an extension downward of the pot chamber. Two flues, one for gas and one for air, each with nearly 0.6 sq. ft. cross section,



Longitudinal Section Through the Four-Pot Recuperative Wire-Annealing Furnace, with Fire Boxes at Each End. The "checkers" are shown more in detail in the transverse section, on the next page

lead into the square space, where the gas is ignited by the heated air.

Above the bottom of the pot chamber some 30 in. is a horizontal flat top dome of refractory special blocks, dividing the pot chamber into two parts, the upper being the receptacle for the pot and the lower forming a combustion chamber, through which mixing of gas and air and complete ignition of gas are effected. The combustion lasts then up through vents in the dome and along the pot sides to vents, equally spaced and 15 in. below the top of the pot chamber,



Transverse Section of Recuperative Furnace for Annealing Steel Wire, Showing Ducts for Passage of Gases and Air

which was fitted with cast iron covers lined with fire bricks.

The vents at the upper end of the pot chamber unite in two flues, conducting the escaping waste gases through the recuperator before they leave the furnace. The recuperator is built of tubular high-grade fire clay blocks, forming when put together two independent systems of a plurality of flues, one system for the escaping stack gases and one for the introduction of combustion air. A layer of air flues runs between and perpendicular to a pair of waste gas flues; the waste gases taking a route downward through their flue system, while the air travels upward, and from the recuperator in one downtake to the burner underneath the pot chamber.

By means of cast iron disk dampers the gas is individually regulated and directed from the main gas flue to each pot, as is the air by means of slide dampers at the air inlet on each recuperator. Each pot has a recuperator with a damper in the stack flue, thus establishing a unit, which can be operated independently from the other pots. On the ash doors of the fire boxes are small slide dampers regulating the air stream for the fuel bed, thus influencing the rate of gas generation.

The pots are of cast iron. After charging them with wire coils and tightening their covers with clay, they are lowered into the furnace by an overhead traveling crane, and the pot chamber closed up with the fire-brick-lined cast iron cover. Each pot is under fire 4 hr., and the wire coils allowed to cool while remaining in the pot. The capacity of a pot is 4000 lb. of wire, the 24-hr. production of the 4-pot installation being thus 32 tons, while during that time 8320 lb. of bituminous coal are consumed. By assuming that a net ton of coal gives 150,000 cu. ft. of producer gas, with 100 B.t.u. to the cu. ft., 1,950,000 B.t.u. is the heat supplied per ton of wire annealed.

There was not the least trouble with the tightness of the brick recuperator. In numerous annealing furnace installations the writer has had to deal with, the brick recuperator appeared to be a very strong design, not a single case being known where a recuperator, during years of operation, became untight or defective. When guarantees as to tightness were asked for, three years were generally granted on heating furnaces for drop forgings and steam hammer shops, where the sensitive recuperative furnaces had to withstand much more severe conditions than an annealing furnace usually is exposed to.

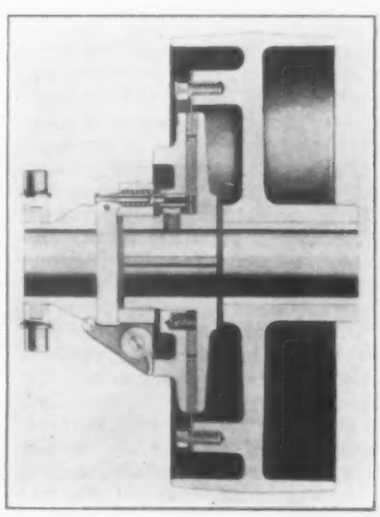
In putting a furnace installation of this or similar kind in operation, a few precautions must be taken to prevent explosions. Although such an explosion is relatively of no dangerous nature, when gaseous fuel with low heating value is used, it is liable to injure the furnace crew.

To this end it is provided that an explosive mixture of gas and air is not brought about in any part of the installation. First of all, a fire at the stack base is maintained at least 24 hr., in order to create good draft in all flues. The air inlets on the recuperators are open all the time not less than ½ in., and while increasing the height of the fuel bed in the fire boxes, a little fire is kept at each burner underneath the pot chambers, to make the brick work red hot at these points. This last measure prevents extinguishing of burning gas in the burners before the entire furnace has reached a good operating heat. As soon as continuous ignition of the incoming gas by hot brick work is certain, no more danger exists, so long as the air inlet is open. While performing this manipulation, the stack flue dampers are kept wide open. Those dampers should be used for regulating purposes only after the whole furnace block has reached operating heat, which should occur after two to five days at the first firing.

The construction of the recuperators requires skilled masons, particularly acquainted with this branch of fire brick work, in order to avoid anything unforeseen at the furnace operation. Furnaces of this design are installed in the plants of the Gunnebo Bruksaktiebolag, Gunnebo, Sweden, and G. Roth Aktiengesellschaft, Vienna, Austria, where they have been in operation for some years.

Disk Clutch Pulley for Direct Drive

A disk clutch pulley for direct drive of factory equipment, intended to eliminate countershafts and extra belting, permitting machinery to be driven directly from the main shaft, has been placed on the market by the Twin Disc Clutch Co., Racine, Wis. Wearing of belts by the fraying of the edges with belt shifters is also eliminated.



Clutch Pulley for Driving Machines Directly from Line Shaft

The details of the clutch pulley may be noted from the illustration. Adjustment is easily made, the lifting of one pin permitting adjustment to 0.005 in., without the use of tools. Positive engagement of the clutch and entire freedom from heating are claimed.

The regular June meeting, and the last of the spring series, of the Cincinnati Chapter, American Society for Steel Treating, was held June 14. In the afternoon the members of the chapter visited the plant of the Pollak Steel Co., and at six o'clock attended a dinner at the Ohio Mechanics' Institute. Following the dinner Dr. J. C. Hartzell, chairman, delivered an address on "Impurities in Steel," followed by a general discussion.

Modern Methods Adopted by Cleveland Manufacturers

Reducing Absenteeism to a Minimum at the Plant of the White Motor Co.—Employee Representation at American Multigraph Co. in Operation

ELIMINATION of absenteeism on the part of factory workers has always been one of the problems of plant managers. One of the common causes for keeping an employee from his work, that results in his machine remaining idle during his absence, is the laying off of men to look after minor personal business matters.

In order to reduce absenteeism to a minimum, the White Motor Car Co., Cleveland, has in operation a department that is rather unique but very practical in its results, known as its Industrial Service Department. This is also spoken of in the plant as the "keep them on the job department," which from results accomplished perhaps better describes its function. This department has proved of much value to the company in keeping its men regularly at work. At the same time it affords the workmen a distinct and appreciated service, and often relieves their minds of anxiety over personal affairs that might affect their efficiency.

The functions of the Industrial Service Department are not closely limited, but a large share of its activities is in looking after the payment of bills of employees, principally for public utility charges, such as gas, electric and telephone bills. However, it does not confine its activities to taking care of these bills, as it pays various miscellaneous bills for the men, such as taxes, water bills, life insurance, monthly bills for household goods bought on the installment plan, etc. This phase of the department's activities is conducted strictly on a cash basis. The employee pays the amount of the bill out of his pocket so that no charge is made against him to be deducted from his pay envelope and no additional bookkeeping is required in the cashier's department.

In handling public utility collections from employees, the department bunches together the payments made by a number of men and makes out a list of those paying together with the amounts, and sends the list with one check in payment of the bills. The department also receives money from the employees belonging to a thrift club and forwards deposits to any bank in which the individual depositor carries an account. It also makes deposits for the men carrying commercial banking accounts. The Industrial Service Department also looks after the recreational activities of the employees, such as baseball, bowling, football, dancing, etc., handling various funds and appointing a manager for each recreational organization.

Other functions of the department include the giving of free legal advice, but not including legal services for conducting litigation, advice on investments, the collection of money from employees for the Cleveland Community Fund and for other charity work that requires solicitation, the giving of free notary service, and assistance to employees in taking out their second naturalization papers, no one being employed who has not taken out his first papers. In addition the department operates the company's cafeteria, which feeds 3500 employees daily.

That the employees are glad to avail themselves of the services of the Industrial Service Department is indicated by the fact that they pay bills to the amount of $8,000 to $10,000 weekly through this department. The department occupies a small office room convenient to the various factory departments and its operation requires a force of five persons.

Vacation with Pay for Employees

Vacations with pay for factory employees have been adopted at the plant of the American Multigraph Co., Cleveland, which has been operating successfully four years under an employee representation plan through an organization composed of a congress representing the employees and a cabinet that is composed of the company's leading executives, as has been fully described by THE IRON AGE. The vacation with pay plan was worked out by a vacation committee composed of employees and approved by the cabinet. During the business depression this company's employees through their representatives in the congress voted themselves a reduction in wages. The vacation plan was given its first trial last year and the experience a year ago led to some modifications of the plan this year by the vacation committee.

Under the plan as adopted for 1923, all persons who have been in the continuous employ of the company for at least two years for the period ending not later than Oct. 15 will be granted a one week's vacation with pay for 44½ hr. at the hourly rate in force when the vacation is taken. In case of five years' service, the employee will have two weeks vacation with pay at the same rate.

Those entitled to only one week will take their vacation during the inventory period from June 29 to July 9, when the factory will shut down. Those entitled to two weeks will take the inventory week and the week preceding or following, although some will be allowed to split their vacation taking the second week at some later period.

Employees whose length of service does not entitle them to a vacation until after the inventory period will also take their vacation during inventory time which will avoid their laying off during the inventory week without pay.

An employee will be allowed to draw wages in advance of his vacation week but the wages due for the week prior to vacation will be held back until he returns so that on his return he will be able to draw wages on the regular pay day to take care of current expenses.

If an employee who is entitled to a vacation is laid off during the vacation period, which extends from May 1 to Nov. 1, he will receive the regular vacation pay. Continuous service under the plan means continuous work except in case the employee was granted a leave of absence or was laid off by the company. It is expressly stipulated that the vacation period shall be used only for vacation purposes and that employees shall not hire out to another employer during their vacation time.

In a 32-page pamphlet devoted to the industrial advantages of Brooklyn, "the Greatest Borough of the Greatest City in the World," the Brooklyn Chamber of Commerce sets forth the geographical, transportation and labor situation in Brooklyn, together with the proposed expansion of transportation facilities and statistics relating to the industrial development and residential growth of the community. The pamphlet is illustrated by a large number of exceptionally good airplane photographs showing the features enumerated in the text, in addition to photographs of some of the principal public and other buildings.

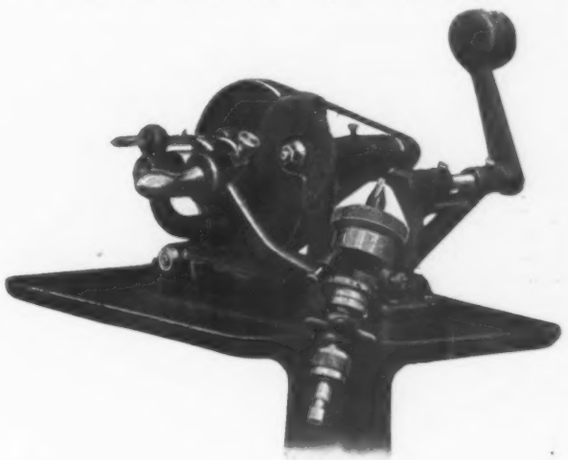
United States civil service examinations are announced for local and assistant inspectors of boilers and of hulls under the steamboat inspection service. Entrance salaries range from $2,100 to $2,950 per year. Full information and application blanks may be obtained from the Civil Service Commission, Washington. Examinations will be held July 25 and 26.

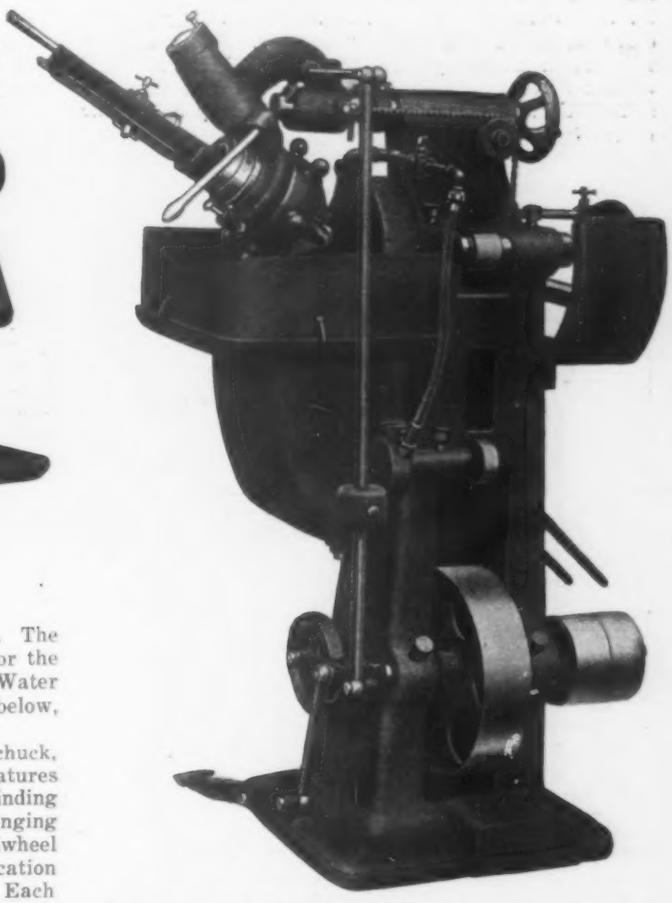
TWIST DRILL GRINDERS

Separate Machines for Large and Small Drills—Quick and Accurate Grinding Claimed

Two twist drill grinders, manufactured by Blau & Co., Vienna, Austria, one of them incorporating automatic features and both intended to permit quick and simple operation with uniform and accurate results, have been placed on the American market by Friedrich Neumann's Successors, Inc., 42 East Twentieth Street, New York. One macnine, model SPK, is for grinding drills from ⅜ to 2 in. and the other, model SPL, for drills from No. 38 to ⅜ in.

The general construction of the machines may be noted from the accompanying illustrations. In the larger machine the grinding shaft is mounted on top of the base, the drill grinding wheel being at one end





Machines for Grinding Twist Drills. The larger machine, for drills from ⅜ to 2 in., is shown at right, and the machine for drills from No. 38 to ⅜ in. below. Features include one setting of drill until grinding is complete, variable lip clearance, swinging motion of chuck and check upon the grinding of each surface

and a wheel for thinning drill points at the other. The drill grinding wheel is entirely inclosed except for the portion at which the grinding takes place. Water pumped to the wheel collects in the large trough below, from which it is recirculated.

The swinging arm and the gripping head, or chuck, for holding the drills while being ground are features emphasized. The horizontal shaft above the grinding wheel shaft forms the axis about which the swinging arm rotates, and is shifted by means of the handwheel at the end, the movement being limited by the location of the adjustable stop collar with binding screw. Each separate swing permits the drill to come in contact with the entire surface of the grinding wheel, an arrangement intended to prevent uneven wear on the wheel. The swinging motion is automatic and is effected through the foot pedal to gears, and a system of levers and rods.

The chuck is designed to permit of the grinding of both cutting edges of the drill without resetting and this, together with the firm hold of the device upon the shank, is said to result in accurately centered and symmetrical grinding of the front surfaces of the drill. A scale is provided to permit the desired amount of lip clearance to be accurately obtained by setting, and positively duplicated on the other lip. The same setting may be duplicated at any time. The drill being ground is inclined shank upward, an arrangement intended to prevent the cooling liquid from running down the drill and wetting the operator, also preventing possible rusting of the drill and parts of the machine immediately adjacent.

The chuck swings about a shaft on the swinging arm, the axis of this shaft constituting also the axis of the grinding cone. Oscillating motion of the chuck while grinding is effected by means of the long handle shown. Set partly into this shaft is an eccentric collar, through which the drill passes as it is set up into the apex angle of the grinding cone, a handle controlling the position of this collar. As turning the collar alters the distance between the axis of the drill and that of the grinding cone, the correct setting and adjusting to any thickness of web according to the diameter of the drill is said to be possible. By means of a slot provided in the collar and a set screw, the chuck is held in proper position. If the scale is set for the correct diameter of the drill, a "normal" lip clearance is produced, if set for larger or smaller diameter than that of the drill placed in the head, the lip clearance will be increased or diminished respectively. The chuck may be rotated through 180 deg. in the collar and held in position for grinding both cutting edges.

The making of the gripping parts of the chuck true and rigid in every direction is a point of construction emphasized. The vise lips are accurately adjustable and may be easily replaced when worn. The setting in and tightening of drills of various diameters is effected by means of a ring, and the loosening of a tightly held drill is said to be accomplished easily. A cup shaped centering device adjustable for length of drill being ground is available for holding the shank.

The point thinning device is a feature. For this operation the drill is placed in the support on the rear of the column at the operator's right hand, the drill touching the small check plate. It is then raised by an adjusting screw until it is seen that a sufficient amount will be ground off by the wheel. To grind the other side of the point an equal amount, a set screw is adjusted immediately on finishing the grind on the first side. Provision is made for truing this wheel.

Machine for Grinding Small Drills

The smaller machine, known as the model SPL, for drills No. 38 to ⅜ in., incorporates many features of the larger machine, including one setting of the drill until grinding is complete; variable lip clearance; swinging motion of the chuck and accurate check upon the amount of grinding of each cutting surface.

The grinding mechanism consists of the swinging arm with device for gripping the drill, and the upright member which is linked with the stop lever for accur-

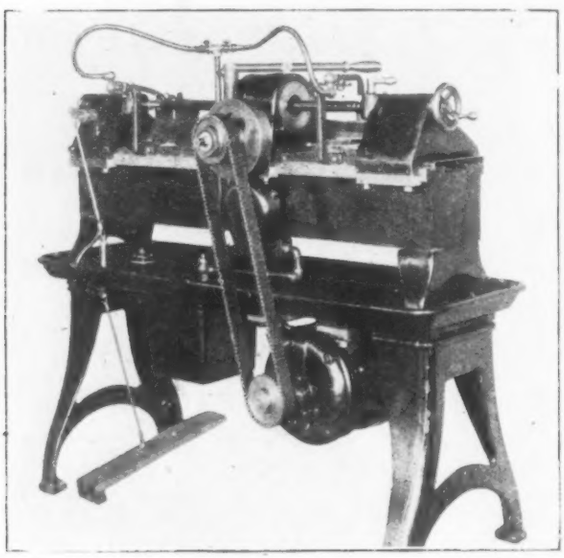
ately limiting the amount of grind on both cutting edges. The arrangement of the gripping device is similar to that of the larger machine. The adjustable lip clearance can be read from a graduated collar mounted behind the chuck body. The chuck may be rotated through 180 deg. by loosening the locking pin, thereby permitting both cutting edges to be ground without resetting the drill in the holder. The drill is tightened in the jaws by turning the star wheel, the shank being held central by adjustment of stop and nut seen immediately behind the star wheel.

In grinding, the chuck is moved up and down and at the same time the swinging arm is given a lateral motion. With his other hand the operator pushes the handle at the left side of the head down, releasing the adjusting screw on this handle until the drill is ground a sufficient amount. The chuck is then swung through 180 deg. and the second surface ground.

Double-End Lathe for Axle Shafts

A double-end lathe for the turning simultaneously both ends of automobile axle shafts, cam shafts and similar pieces has been placed on the market by the Porter-Cable Machine Co., Syracuse, N. Y.

The headstock is located in the center of the bed as shown and carries a hardened and ground ball-bearing mounted spindle. The latter is 6¼ in. long, has a 2⅛-in. hole extending through it and has a right angle drive through a worm and worm gear. An expanding-type clutch is employed on the machine, being mounted on the drive shaft of the headstock. It is designed sufficiently heavy to permit of taking heavy cuts. The clutch is controlled by a lever mounted on the headstock as shown, the lathe being stopped the instant



Rear View of Machine for Turning Simultaneously Both Ends of Automobile Axle Shafts and Similar Pieces. Drive arrangement and other details are clearly shown

the clutch is disengaged. The shell of the clutch runs continuously and is driven from the motor by a chain and sprocket, as shown.

The carriages of the machine are operated from a hardened steel cam and roller. A feature of the carriages is that both straight and taper work can be turned with them, and that they are returned automatically to the starting point after reaching the end of the cut, which is intended to relieve the operator of movements other than loading and unloading and starting and stopping the machine. The carriages are equipped with chip shields for the cross feed screw, other working parts of the lathe being also protected from dirt and chips. The chain from the motor to the clutch is also covered.

The machine takes 32 in. between centers. One of the tailstocks is screw operated; the other is designed for quick operation and is foot operated, leaving both hands of the operator free for loading and unloading the machine.

The weight of the machine is 1500 lb. The unit arranged for belt drive is also available.

Incorporation papers for a belt-line railroad encircling the outskirts of Columbus, Ohio, estimated to cost $12,000,000, have been applied for. John E. Bleekman, New York capitalist, heads the company which is seeking the charter.

To Serve Visitors from Abroad

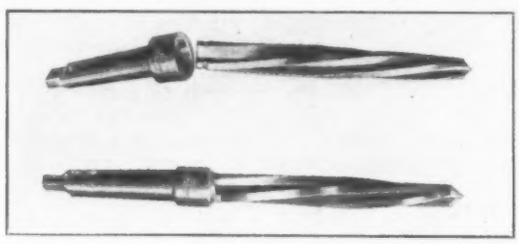
The English Speaking Union, whose object is to promote more cordial relations between the people of the United States and Great Britain, has established at its National Headquarters, 345 Madison Avenue, New York, a guide, motor and travel advisory service for the assistance, especially, of British visitors to this country. The new service will be in charge on an honorary volunteer basis of a member of the Union, Frederick A. Halsey, a retired mechanical engineer and former editor of the *American Machinist*. On account of his long connection with the machinery industry and acquaintance with manufacturing in this country, manufacturers of machinery who are visiting this country will find his assistance of great value. Mr. Halsey will have office hours at the union's rooms, Tuesdays and Thursdays from 2 to 3 o'clock, and will be available at other times by appointment. The service will be without charge.

High-Speed Steel Bridge Reamers

High-speed bridge and boiler reamers in both five flute straight and four flute spiral types have been placed on the market by the Latrobe Tool Co., Latrobe, Pa. Both styles are available in either bridge or short car reamer length.

The points of the tools are ground sharp with a chamfer cutting edge on each flute as shown in the illustration, which is intended to facilitate entering burred holes or holes that are not matched.

The body is made from a bar of high-speed steel rolled to the proper profile to form the flutes when the bar is twisted. It is machine finished and hardened before being assembled in the carbon steel shank. The shank is fastened by a special process. A hole is drilled in the end of the shank to receive the end of the reamer and notches are cut in the body of the reamer where it is inserted in the shank. The latter is then chucked in a high-powered lathe, the reamer inserted in the hole and the tailstock center brought hard against the point of the reamer. The lathe is started at high speed and two high-speed steel spinning



High-Speed Steel Bridge Reamer. The points of the tools are ground sharp with a chamfer cutting edge on each flute, which is intended to facilitate entering burred holes or holes not exactly matched. The method of fastening the reamer to the shank is a feature

tools are brought against opposite sides of the large diameter of the shank, over the joint to be made. The friction is said to heat the shank red hot in a few minutes, and as soon as the shank metal is hot enough to work greater pressure is applied to the spinning tools, the work still rotating at high speed. The outside diameter is reduced and the metal of the shank flows around the reamer body and keys in the notches and flutes shown.

Shrinking of the shank from the higher temperature is said to make the joint tight, only finish grinding being required to complete the tool.

THREAD GENERATING MACHINE

Higher Speeds with Corresponding Increase in Production Claimed—Features Outlined

A machine for generating threads such as those on taps, worms, hobs and similar work, which works on the molding generating principle and employs a helical gear shaper cutter, has been placed on the market by the Fellows Gear Shaper Co., Springfield, Vt.

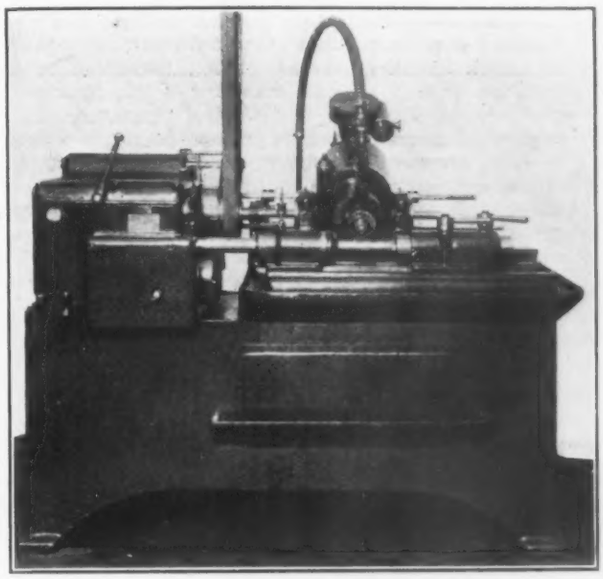
The principle of operation of the machine, which is illustrated herewith, may be understood best, perhaps, by considering threads as rack teeth which are wrapped around a cylinder in a helical path. In generating the threads the work rotates upon an axis at right angles to the axis of the cutter. The cutter and work are geared together in relation to the number of teeth in each. The cutter is carried in a head retained in a slide that is traversed longitudinally, and as the cutter is rolled in mesh with the work, it produces threads by the molding generating process.

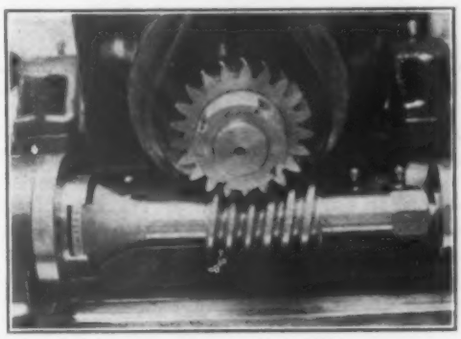
The production possibilities of the thread generator may be noted from consideration of the cutting action of the generating cutter. The principle of generation, as applied on this particular machine, permits the generating cutter to be operated at high speed, bringing with it, it is claimed, several advantages over other forms of thread cutting tools. First, as the cutter is rolled in mesh with the work, any point on the cutting edge of the tool remains in contact with the work for a very short period of time. Second, this rolling action enables the cutting tool to take a "shaving" cut, so that a comparatively coarse feed can be used. Third, one tooth is not depended upon to do all the cutting, as there are many teeth, brought successively and at a rapid rate into contact with the work.

The principle of operation is somewhat analogous to that of using a circular cutting tool in a lathe, and rotating it rapidly as it is being traversed across the work. The gear shaper cutter, as applied in this manner, has an advantage in that the cutting tool, instead of being a continuous circular cutting edge, is interrupted by tooth spaces preventing the transmission of heat completely around the cylinder. These tooth spaces also fill the function of a chip breaker, preventing, it is said, chip wedging. A further distinction is that with a circular rotary cutting tool, the action of cutting is closely analogous to turning. With the gear shaper cutter, it is said that the action is turning and milling combined, employing the good features of both with none of the disadvantages.

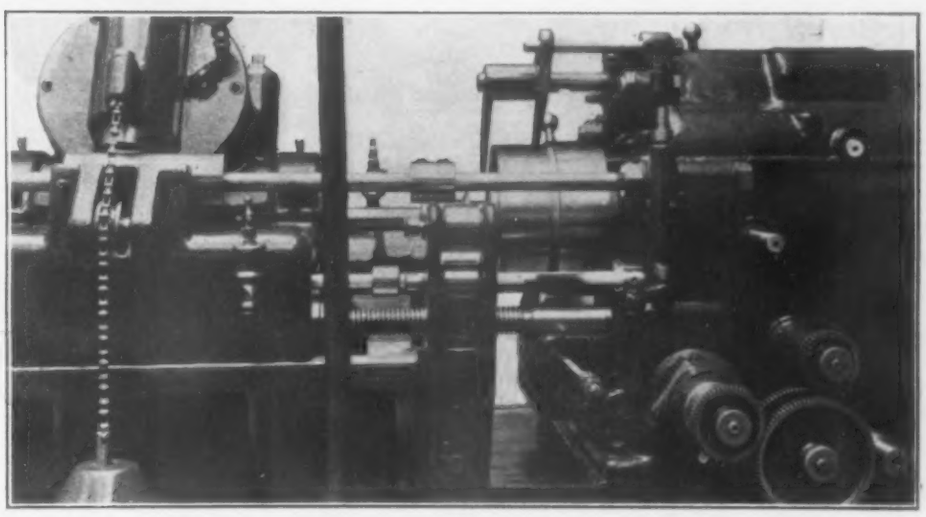
As an illustration, let it be assumed that a triple-thread worm, 2.100 in. in diameter, is being generated, and that the worm can be rotated at a speed of 600 r.p.m. If the cutter used has a pitch diameter of 3½ in., and the linear pitch is 0.525, it would have 21 teeth, and would rotate at a speed of 57.14 r.p.m.

At a work speed of 600 r.p.m., the cutter would be operating at 330 ft. per min. at the circumference of the work. Each tooth of the cutter would remain in contact with the work for approximately 1/20 sec. and 1200 cutting teeth would be presented to the work every minute. Compared with speeds used in milling and turning, with tools of high-speed steel, it is said that speeds ranging from three to five times as great can





Machine for Generating Threads Such As Those On Taps, Worms and Hobs. Front view showing general construction is at the left and a close up of the cutting of double thread worm, above. The machine works on the molding generating principle and employs a helical gear shaper cutter. High-speed operation is a feature



Arrangement of Driving and Tripping Mechanisms and Other Details May Be Noted From View at Right. The cutter slide may be traversed in either direction. The ratio between the number of teeth in the cutter and work is varied by means of change gears

be employed in this particular process, with a corresponding increase in production.

Fundamental Features of Machine

There are three main conditions which must be met in a machine for generating threads. The cutter must be kept in proper step with the work; arrangement must be made to traverse the cutter longitudinally along the work; and provision must be made to take care of this translating motion of the cutter along the work.

In this machine the ratio between the number of teeth in the cutter and work is varied by means of change gears; change gears are used also for traversing the cutter along the work at a certain feed per revolution of the latter; and change gears and the differential mechanism take care of the translating motion of the cutter.

In order that the cutter-slide, which is operated by a lead screw, may be traversed in either direction, a reversing clutch is used on the main feed shaft. After the cutter has completed its function and become disengaged from the work, the tripping mechanism operates, stopping the machine. Where the work can be finished in one cut, the cutter traverses from right to left, and when it goes out of contact with the work, the latter is removed, another piece inserted, and the reversing clutch shifted, so that the cutter traverses from left to right, thus obviating the necessity of returning the cutter-slide at the completion of each cut.

The head that holds the cutter is provided with trunions, permitting it to swivel and thus elevate or lower the cutter with relation to the work. The control of this head is through a depth control bar, supported on a seat in a projection on the cutter-slide. Resting on this bar is a shoe or roll, which is held in a rod that passes up through the head and is threaded into a worm wheel, the latter being operated through a worm and hand-wheel for setting the cutter to proper depth. The depth control bar can be made in various shapes so that roughing and finishing cuts can be taken, or it can be made plain for single purpose operation.

Designed for Large Range of Work

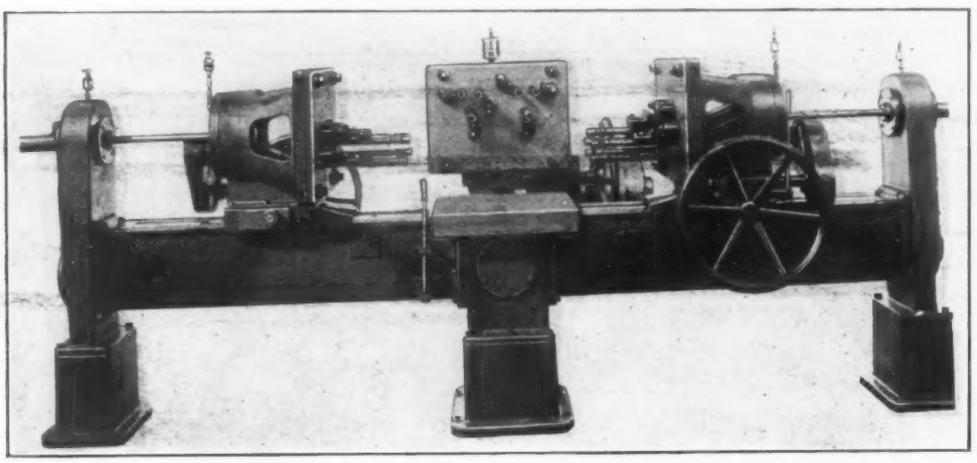
The machine is designed for handling a large range of work. It is known as the No. 1 type, and with standard equipment has the following capacities: Maximum length of thread, 12 in.; maximum center distance, 18 in.; outside diameter, 4 in.; maximum pitch, ⅝ in. linear or 5 diametral; maximum helix angle, 23 deg. and maximum pressure angle, 14½ deg.

With standard equipment, the machine will cut single, double, triple and quadruple threads of ¼ in. linear pitch, or 6 mm. to ⅝ in. linear pitch, or 16 mm., inclusive. By substituting a special worm and worm-wheel in the cutter head, single threads from 1/20 in. linear pitch (0.050 in.), or 2 mm., up to and including ¼ in. linear pitch, or 6 mm., may be cut.

Tapping Machine for Cylinder Blocks

The three-way tapping machine illustrated, designed for tapping the holes in both the ends and sides of cylinder blocks, has been placed on the market by the Fox Machine Co., Jackson, Mich.

The arrangement of the heads may be noted from the illustration. The rear head has six spindles, the left four and the right six, the heads carrying ⅜-in., 16-thread taps. The spindles are mounted on the company's patented cluster plates, which are said to give the rigidity of fixed center heads, as the holding arms are doweled to the plate.



Three-Way Machine for Tapping Holes In Ends and Sides of Cylinder Blocks. A 10-hp. motor behind the rear head drives the three heads. Reversing is automatic

A 10 hp., 1200 r.p.m. motor, mounted behind the rear head, drives the three heads. The transmission is by a silent chain from the motor to the driving clutch, the reversing clutches being carried on the shaft running to the front of the machine. On this shaft is mounted also the chain and sprocket which drive the spindles in the rear head. The shaft extends to the front, where the bevel gears drive the horizontal shafts which carry the motion to the chain sprocket at each end of the front column. The drive is then to the shafts that drive the spindle pinion gearing in the heads.

By means of the lever shown at the left of the table at the front, the heads can be started, stopped or reversed. When the work is in position on the table the forward movement of this lever starts the taps revolving in the right-hand direction. The heads advance at the same rate as the taps, which is emphasized as assuring perfect threads.

The reversing is automatic, the heads being returned at the same ratio until they stop automatically. Change gears are carried for each lead, which advance and return the heads in unison at a speed corresponding to the pitch of the taps. These gears can be changed to accommodate taps of different leads. The tapping speeds are about 20 ft. per min.

The weight of the machine is 6350 lb.

May Absorb Damascus Brake Beam Co.

The American Steel Foundries, Chicago, has entered into negotiations with the Damascus Brake Beam Co., Cleveland, which will probably result in the passing of the control of the latter company to the former. The plans for the purchase of the Damascus plant provide for the exchange of one share of Damascus stock for one and a half shares of the preferred stock of the American Steel Foundries. At the present market price this would mean about 153 for Damascus stock as compared with the last reported sale at 105. The Damascus Brake Beam Co. has a capital stock of $500,000 in $100 par common stock. Its plant occupies a 14½-acre site at London Road and the Nickel Plate Railroad. The officers are C. D. Jenks, president; K. F. Gill, vice-president, and A. E. Adamson, secretary.

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Misrepresentation of the Steel Report

Much unjust criticism, based upon misinformation, is being given publicity by newspapers and speakers in connection with the recent report of the American Iron and Steel Institute committee on the 12-hour day. For example, the usually fair and well-informed New York *Evening Post* says that "It is encouraging to hear from one of the independent steel concerns—the Colorado Fuel & Iron Co., which, with more than 5000 employees, adopted the 8-hour day four years ago—a vigorous protest against the American Iron and Steel Institute's indorsement of the 12-hour day." The Colorado company, as a matter of fact, has filed no protest against the action of the committee. Some time ago President Welborn made a statement to the effect that the change to the 8-hour shift was made Nov. 1, 1918, the hourly, tonnage and piece rate being increased 10 per cent when the working shift was reduced from 12 to 8 hours, and the results proved satisfactory. This statement was dug up recently by the Federal Council of Churches, which certainly has not been distinguished for fairness in its treatment of the steel industry, and was published as if it were intended as an answer to, or a criticism of, the report of the committee. President Welborn did not criticize the committee, nor did he make any protest. He had merely given a statement of his experience before the report of the committee was formulated.

Another inaccuracy is the statement that the institute indorsed the 12-hour day. The institute did not indorse the 12-hour day, but adopted the report of the committee, which plainly stated that under proper conditions the members of the committee would favor entirely abolishing the 12-hour day, but that they did not favor the adoption of the 8-hour day under present conditions, referring particularly to the shortage of labor.

Another form of misrepresentation which has been given wide publicity is the statement that the wages of the employees of the Colorado plant were increased when hours were reduced. It is true that 10 per cent was added to the wages for 8 hours so that the men were paid for 8.8 hours, but owing to the reduction of time from 12 hours, the actual reduction in pay per day was 26 2/3 per cent. The men of the Colorado plants were willing to take this reduction. When the Steel Corporation, in October, 1918, adopted the 8-hour basic day and time and a half for overtime, the employees of the Colorado Fuel & Iron Co., through their employee representation, expressed a desire to work only eight hours without overtime. The management was surprised by this proposition and decided to grant the 10 per cent increase, but there was no thought on the part of either the company or the employees of paying as much for eight hours as the men had received for 12.

It has been accepted as one of the consequences of the war that bitterness, unfairness, class prejudice and reckless impugning of motives should mark the discussion of social, industrial and political questions. Violent attack has been substituted for argument. The Inter-Church report on the steel strike was offered to the public as a judicial survey of labor conditions in a great industry; but very early it threw off its mask and descended to rancor and unfairness.

The abolition of the 12-hour day in certain employments at iron and steel works presents a problem full of complications. None of the engineers who have studied it from without, in an honest effort to aid in its solution, has failed to acknowledge its difficulties or to pay tribute to the earnest desire of men in the industry to deal fairly with every interest involved. Abuse and misrepresentation are evidently favorite weapons of many of the critics recently heard from, for they have been handily used. But intemperate and ill-judged as these attacks have been—as ill-judged as the Inter-Church attempt to deliver the steel industry into the hands of a labor union autocracy—they will not stop, even though they may retard, the movement for better steel works labor conditions to which many progressive employers have been devoting themselves.

Changes in the cost of living, as reported by the National Industrial Conference Board, have been relatively slight since the end of 1921. For January, 1922, the highest of the past seventeen months, the index stood at 161.4, compared with 154.5 for August, the lowest month. May, 1923,

with 160.3, is the highest since January, 1922, but is only 3¾ per cent above the lowest figure of the past three years and less than 2 per cent above the average of the past seventeen months. Fuel continues to be relatively the highest item in the workman's budget, with clothing and rent both well above the average of all items. Food is comparatively low, having been continuously below the average of all items for more than two years.

Our Pig Iron and Steel Output

Production of pig iron, including charcoal iron, in the half year now ending may be estimated at 21,000,000 tons, with a probable error of less than a hundred thousand tons, and production of steel ingots at 23,500,000 tons, with a probable error of less than a half million tons. The steel mills have one working day more in the first half of the year than in the second half, while the blast furnaces have four more days in the second half than in the first half. Weather conditions are not so good in the second half as in the first half.

One may say that for six months pig iron has been produced at 42,000,000 tons a year and steel ingots at 47,000,000 tons a year. Record calendar year outputs have been 39,434,797 tons of pig iron, in 1916, and 43,619,200 tons of ingots, in 1917.

The question is being discussed whether, or by how much, the production and shipment of steel has exceeded the consumption. Production is always known with a fair degree of precision, and with that goes the matter of shipments, for mills can never produce much more than they ship, and when even the small quantity of steel piles up, usually on account of railroad conditions, news of the fact is widely disseminated. At present there is no accumulation of steel at mills to amount to anything in a general comparison.

As to consumption, on the other hand, nothing is ever known in the aggregate except by inference, with production as the tonnage basis. With production as it has been, consumption is a question of whether stocks in buyers' hands have increased.

The argument is made that consumption must be very heavy, nearly if not quite equal to current production, or steel buyers would not be taking their deliveries so freely on old orders and contracts. To this argument the rejoinder comes from some quarters that the old orders are at lower prices than those now ruling, hence the buyers would naturally take the steel even if they have no occasion to use it at once.

The latter argument is impressive, if only the present rate of steel production is involved. The case is somewhat different when we see that in six months 23,500,000 tons of ingots have been made. Consumption has not decreased. If anything it has increased. It is a good guess that it is greater in the second quarter of the year than it was in the first quarter.

The relation between pig iron and steel is peculiar. At 21,000,000 tons of pig iron in the half year and 23,500,000 tons of steel ingots we have produced 89½ per cent as much pig iron tonnage as ingot tonnage. In 1922 we produced about 34,600,000 tons of ingots and 27,220,000 tons of pig iron, the proportion of pig iron to ingots being less than 79 per cent. The year was an unusual one, the coal strike curtailing the production of pig iron, whereby accumulations were eaten up and much scrap was used. The point about scrap should not be stressed too strongly, however, for the needed scrap was easily obtained. It was not until after the coal strike was settled that scrap prices had much of an advance. It is clear that in the past six months it has been easy to make all the pig iron the steel industry needed.

Raising and Lowering Wages

At the conference of the Taylor Society, June 7 to 9, at Syracuse, N. Y., on "the business cycle" and antidotes that may be applied, Willford I. King of the National Bureau of Economic Research advised: "Raise wages as little as possible, thus avoiding the necessity of severe wage cuts at a later date." The United Business Service, established by Roger W. Babson, lately referred to increasing importations threatening to turn the trade balance against us and said: "This means that every man in business should exert the full force of his influence to keep prices of labor and raw materials as low as possible. Only by such concentrated efforts can we expect to hold present gains." The *Manufacturers' Record* vehemently objects to this counsel, and there are others who will object to the idea of endeavoring to hold wages down.

It is a case where economics and psychology come together. Economics teaches that stability in commodity prices and wage rates is a good thing. Psychology teaches the same thing. To raise wages and then to lower them is not good, for the pleasant feeling created by the increase does not balance the unpleasant feeling created by the decrease. Nor is the influence upon business generally a good one. News of advancing wages tends to promote inflation in commodity prices, and news of reduction in wages tends to encourage buyers to defer purchases, at a time when the interests of business activity require that purchases be made.

Raising wages does increase costs and increased costs do affect our foreign trade unfavorably. It is commonly held that our foreign trade is an advantage to all our people. If, after all, it is not, let us hasten to get the fact developed so that we may use the newly established fact as one of the fundamentals in our further procedure.

Advancing wages that must afterward come down causes trouble and it is human nature that it should be so. We are dealing with men as they are, not as they would be if the Golden Rule were their sole guide to thought and conduct. The trade paper referred to above mentions the Golden Rule as a suggestion that the doctrine of the United Business Service is "diabolical."

It would seem that some of this discussion really represents the divergent views that have been taken of the relation of wages to the general movement of commodity prices since the war. The contention for a "living wage," determined by an appraisal of the satisfactions of life that should

be afforded the average family, is not new. But along with it we now have the view that the war has established the demands of the wage earner on a higher level and that there will be no return to the pre-war scale, even though the purchasing power of the wage be increased by reductions in many commodity prices. That is a large question. It involves vastly more than "the business cycle" and the more stabilized wage urged at Syracuse as a means of shortening the swings.

Railroad Valuations

In view of the approaching onslaught of radical "statesmanship" upon railroad valuations already made, and the tentative valuation made by the Interstate Commerce Commission in 1920, in which a total value of $18,900,000,000 was placed upon our railroad system, recent dispatches from Germany are interesting. Disregarding the sections taken from Germany by the Treaty of Versailles, it is estimated in Berlin that the 57,545 kilometers of line remaining have a present value of 30,000,000,000 gold marks. Working this out in terms of miles and dollars, the value is placed at almost exactly $200,000 per mile.

Dividing the Interstate Commerce Commission's aggregate valuation of American railroads by 265,000 miles, we reach an average of approximately $71,000 per mile, or about one-third the German figure.

We know that the German structures, such as stations, bridges, etc., are very heavy and that 70 per cent of the line mileage is double tracked. We know, however, that American rolling stock averages perhaps twice as heavy as the German, that the rails are heavier and that construction costs in the United States, on a gold basis, through the past half century, have been much higher per unit of work than has been the case in Germany. If, therefore, we offset the heavier German structures and the larger proportion of the German lines which goes through thickly settled districts, with high land valuation, by the heavier unit cost of construction in the United States plus the heavier American rolling stock, it would appear that the value per mile of line should not be far different in the two countries.

Referring to this question of valuation in his recent book, "Railroad Freight Transportation," L. F. Loree declares it quite safe to say that on the level of wages and prices of material in 1920, when the tentative valuation was made, "this property could not have been reproduced for $40,000,000,000. What other business could have sustained such a blow and have survived?"

As the valuation is the basis upon which the 5¾ per cent rate of return allowed by the Transportation Act is figured, it is evident that there is a vast difference between the amount of allowable earnings estimated on the tentative valuation and what would be permitted by a valuation along Mr. Loree's ideas. At the same time, the figure he places upon the railroads as their true value represents only $151,000 per mile of line, or about three-fourths of the German unit value cited. If the facts as to costs and methods of construction are given due weight, one must incline toward the higher valuation rather than the lower, particularly in view of the recent decision of the Supreme Court that utility valuations must be determined on the basis of the present cost of replacement.

The Value of Impact Tests

The practical as well as technical value of certain impact tests of forged steel was given new emphasis at the sectional meeting of American steel treaters last week at Bethlehem, Pa. The conflicting results of other tests of the same nature were also shown. It was brought out in a careful series of Charpy impact tests that some steels possess greater resistance to breakage by impact blows at certain temperatures than at others, and that a variation in heat treatment renders some of these steels more resistant at lower temperatures than at the higher. Such knowledge also explains the behavior of steel under certain service conditions which was not fully understood and which tensile tests did not reveal. The testimony by another investigator that his own Izod impact tests on steels were not comparable with those obtained by the Charpy machine raises a question as to the value of such tests in general.

Undoubtedly impact test methods can furnish a measure of the work necessary to rupture steel, but results of real value cannot be obtained unless the various methods are standardized. As in hardness tests, where the Brinell machine has become the standard, some machine or some test bar should be recommended as a standard in impact tests, so that the valuable data which are possible can be correlated and used. Some work of this nature is being done, but its speedy completion is a necessity.

One of the interesting market trends of recent months has been the effect on values in the copper, lead and zinc markets, of the daily quotations in London markets. For many years the American Straits tin market has been extremely sensitive to London values and speculation. London has usually predominated. But in copper particularly, and also in lead and zinc, the main influences have been usually domestic in origin. In the copper market of late London values have been frequently a factor here, due partly to the importance of foreign consumption and the effects of the Ruhr occupation. But domestic copper consumers are more watchful now than ever of all influences marketwise and have become closer students of market trends. In the zinc market, London has been a factor in making values here, partly from increased demand there, with Continental and other supplies less abundant. While lead is not influenced to the extent of copper and zinc, London values often are still a factor here, particularly when the domestic price is low enough to invite importations. All these facts are indicative of the changes which the war has brought and mean that, until normal conditions prevail, American non-ferrous markets will show some sensitiveness to foreign conditions. It may yet develop that world industrial markets are becoming more closely knit and more interdependent than ever.

TO EXTEND SHORT DAY

Trumbull Steel Co. Puts More Men on Eight Hours—Status in Other Plants Explained

YOUNGSTOWN, June 19.—Expansion of the 8-hr. day in its open hearth department will be introduced July 1 by the Trumbull Steel Co. at Warren, when men now working the longer shifts will be put on an 8-hr. basis.

Analyzing the shorter day and its gradual introduction into the steel industry, a district executive states:

"We are not opposed to the 8-hr. day and we are not in favor of the 12-hr. day. The public does not know that less than 25 per cent of the men employed in the independent plants in the Youngstown district work 12 hours, and seven days a week, while not more than ten years ago almost 75 per cent of the men worked 12 hours, seven days and six days per week.

"The establishment of a shorter workday in the steel plants was gradual. The men had to be educated first to accept the 8-hr. day at somewhat lower pay than they were receiving for 10 or 12 hours' work. In case of high wage earners and older men this educational process progressed easily and there was no trouble in establishing shorter working periods, but the younger, more ambitious and lower-paid element still prefers the longer day and would resent shorter work days unless they get the same pay they are receiving now. Many of them even then would ask for jobs where they could put in more time.

"Today the long day is in practice in two departments only. They are the blast furnaces and the coke works. There are 12-hr. shifts in other departments, but the number of men engaged is very small. Not very long ago workers of the open hearth department went on an 8-hr. shift in three plants in the Youngstown district.

"Work at the blast furnaces and coke ovens is not only continuous, but absolutely mechanical. Putting three shifts to work in the blast furnaces will not increase production a single ton. It does not make any difference in furnace operation if two or three men are in attendance during 24 hours, for the time of the heats is the same. Blast furnace workers are actually engaged about three or at the most four hours out of the 12 on duty. Between heats they may rest and many of them sleep. The same is true of the coke ovens. The time of coking is mechanically fixed and shorter working hours for the men in the department would not increase production or make the men more efficient or their work easier.

"If the public would pay at least part of the increased cost of production of pig iron, which is made with coke, and which is the base cost of all steel products, and if the men in the departments could be educated to the point where they would accept the 8-hr. day instead of the more money-paying 12-hr., the 8-hr. day would be universal within a short time, provided men could be found to fill the jobs of the third shift. Today the shortage of labor would make the establishment of the 8-hr. day in the departments which are not working shorter periods almost impossible.

"There are many places in a steel plant where 8-hr. shifts are almost impossible without adding greatly to the cost of making the finished product. Such a department is the pipe mill, in which almost 30 per cent of its men are employed by the Youngstown Sheet & Tube Co.

"The pipe mills of Sheet & Tube and Republic Iron & Steel are on a 10-hr. shift. The men on the day shift work six days a week, while on the night shift five nights only are worked. The men change every other week and therefore work only 110 hr. in a full two-week period, or an average of but 55 hr. per week. Not more than two years ago, the same men worked 10 hr. on the day shift and 12 hr. on the night shift, or 120 hr. per two weeks.

"Three shift operation of pipe furnaces would be almost impossible because the bottoms of the furnaces must be renewed and this is done between the time of the changing of the shifts."

The reduction of working hours in the steel mills therefore is a gradual process, which if continued at the same rate as it has progressed during the last ten years would place the entire industry on an 8-hr. basis in not more than five or six years.

Rolling mill crews, employees in the Bessemer departments and all crews in sheet and tin mills, which are the principal finishing units in the Youngstown district, are on the 8-hr. shift, with one of the shifts working but 40 hr. a week. By far the largest number of employees in the steel plants of the Youngstown district belong to the class which works 8 hr. per day. Next come those who work 10 hr. per day, and the smallest number work 12 hr. per day.

Bookings of Steel Castings

WASHINGTON, June 20.—Department of Commerce figures show for May a slight decline from the April tonnage of commercial steel castings, with 89,493 net tons against 90,968 tons. The May figure represents 92.4 per cent of capacity. Comparative figures for other dates are shown on the table.

Bookings of Commercial Steel Castings

	Total		Railroad Specialties		Miscellaneous Castings	
Month 1923	Net Tons	Per Cent of Capacity	Net Tons	Per Cent of Capacity	Net Tons	Per Cent of Capacity
January	100,605	103.8	47,879	125.0	52,726	90.0
February	90,152	93.0	39,845	104.0	50,307	85.8
March	143,564	148.2	76,409	199.5	67,155	114.6
April	90,968	93.9	39,610	103.4	51,358	87.6
May	89,493	92.4	38,788	101.3	50,705	86.5

The Bureau of the Census has completed a tabulation of the annual capacity and bookings of both miscellaneous and railroad castings by these same companies. The figures for companies representing about 6 per cent of the miscellaneous castings are not available prior to 1920 and the totals have been prorated by that amount in order to allow comparison. The railroad bookings are complete. The change in capacity and total bookings for each year, from 1913 through 1922, are shown below:

Capacity

Year	Total	Railroad Specialties	Miscellaneous Castings
1913	956,541	452,400	504,141
1914	961,436	452,400	509,036
1915	961,436	452,400	509,036
1916	998,076	452,400	545,676
1917	1,063,642	459,600	604,042
1918	1,104,443	459,600	644,843
1919	1,147,368	459,600	687,768
1920	1,162,800	459,600	703,200
1921	1,162,800	459,600	703,200
1922	1,162,800	459,600	703,200

Bookings

Year	Total Tons	Per Cent of Capacity	Railroad Specialties Tons	Per Cent of Capacity	Miscellaneous Castings Tons	Per Cent of Capacity
1913	605,592	63.3	284,908	63.0	320,684	63.6
1914	458,238	47.7	213,954	47.3	244,285	48.0
1915	676,144	70.3	299,820	66.3	376,324	73.9
1916	1,061,399	106.3	555,378	122.8	506,021	92.7
1917	895,388	84.2	311,304	67.7	584,084	96.7
1918	1,133,910	102.7	487,211	106.0	646,699	100.3
1919	435,066	37.9	116,791	25.4	318,275	46.3
1920	793,305	68.2	318,226	69.2	475,079	67.6
1921	287,674	24.7	114,888	25.0	172,786	24.6
1922	785,059	67.5	399,174	86.9	385,885	54.9

May Abolish Alabama Convict Labor System

BIRMINGHAM, ALA., June 18.—The summer session of the Alabama legislature will stage a battle for the abrogation of the Alabama convict lease and hire system. The State feeds, clothes, houses, furnishes physicians and controls hours of work of the 1400 State convicts at mines, receiving so much per ton of coal mined. County convicts are hired to mines under straight lease. The Pratt Consolidated Coal Co., Sloss-Sheffield Steel & Iron Co. and Bessemer Coal, Iron & Land Co. are among the largest users of convicts. Governor Brandon has taken a stand in favor of continuing the State plan, while unofficial bodies of men and women seek elimination of both State and county plans. Gross revenue is about $800,000 a year. The lease and hire system was to have been eliminated this year, but on opening of the new administration its elimination was postponed for four years until after this administration as was done before.

OPERATORS MEET

Topics Affecting Coal and Coke Production Considered at a Large Meeting

UNIONTOWN, PA., June 18.—Two hundred and fifty coal and coke industry representatives comprising 87 per cent of the coke production in western Pennsylvania and 90 per cent of coal production in the same district were present at a dinner-meeting held at the Summit Hotel, Thursday evening, June 14, under the auspices of the Fayette Greene Coal Producers' Association. The meeting was the largest of the kind ever held in Fayette County.

Two members of the bituminous operators' special committee, two officers of the National Coal Association and three prominent railroad officials addressed the meeting.

Importance of the industry putting up a united front against the attacks directed upon it; criticism of the modern tendency toward over legislation, commissions and investigations; consideration of transportation problems and other matters of interest to the industry were discussed. T. W. Guthrie, president of the Hillman Coal & Coke Co., and a member of the bituminous operators' special committee, discussed the necessity for association activities and dwelt upon the various problems facing the industry at this time. He referred to the recent strike in the industry and the activities of the so-called progressive miners' union. He touched upon the legislative trend, stating that 40 odd bills seriously affecting the coal industry had been introduced at the recent session of the Pennsylvania Legislature.

J. C. Brydon, chairman of the bituminous operators' special committee, presented the activities and accomplishments of that committee relating the enactment of the legislation setting up the United States Coal Commission. He touched upon the organization of the committee which represents 90 per cent of the bituminous output of the United States. He made reference to the war chest of millions of dollars of the union and of the committee's purpose to bring about, if possible, an investigation of the distribution of this war chest by the United Mine Workers. He estimated that the collection of data and reports required under the act established by the United States Coal Commission had cost the operators $5,000,000 and might possibly cost $10,000,000 before the work was completed. He said that the coal commission was instructed by its created act to determine facts within a year which could not possibly be deduced within five years.

Representatives of the railroads told of plans for transportation improvements, what had been accomplished and what was in prospect, saying that the present car supply will continue fairly adequate during June, July and August, but a car shortage may be expected around Sept. 1.

Coal production showed little general change in the region last week, although the merchant output gained a considerable degree. Third quarter price negotiations continue with buyers, generally speaking, contracting at around $6. The policy in the trade here is to make no contract under $6.50 for third quarter, although one small contract was made under peculiar circumstances for $5.50.

TO CURTAIL PRODUCTION

Blast Furnaces to Be Blown Out—Some Mills Less Active

At least three of the active blast furnaces in the Mahoning and Shenango Valley district will go out during the next two weeks. Youngstown Sheet & Tube Co. will put out one of its Youngstown furnaces for relining, and one of the Haselton furnaces of the Republic Iron & Steel Co. is to be put out probably around July 1 and rebuilt. Ella furnace, Reliance Coal & Furnace Co., at West Middlesex, Pa., is working off accumulated ores and as soon as the stock is exhausted the furnace will go out. The ore stock at this furnace is sufficient to keep it going until about the end of this month.

No. 5 blast furnace in the Haselton group of the Republic Iron & Steel Co., Youngstown, will have been in blast six years on Aug. 17 next. During this period of its operation it has produced more than 1,000,000 tons of pig iron. The stack is still operating satisfactorily. The Republic company is arranging for the rebuilding of its No. 3 furnace in the Haselton complement, but there is no plan for the present suspension of the unit. It will not be blown out until iron demand slackens or it becomes necessary to reline the stack.

Heat Causes Curtailment of Some Mill Operations

YOUNGSTOWN, June 19.—District iron and steel schedules are being sustained in the Mahoning and Shenango Valleys, except for the curtailment in sheet and tin plate operations due to the heat.

This week the Youngstown Sheet & Tube Co. started its new 45-in. universal plate mill, known as No. 3 universal skelp mill.

Crew shortages due to weather conditions are holding back production in the sheet and tinplate divisions of the industry, the curtailment depending to a large extent from week to week on the degree of heat.

The A. M. Byers Co. has suspended one of its skelp mills at the Girard works, while its puddle furnaces are handicapped for lack of man-power. Of 88 furnaces, only 65 are active. Less than one-half the puddle furnaces of the Sheet & Tube company are on the active list.

Pig iron production continues at a high rate, with 43 of 46 blast furnaces in the district blowing.

Virtually all plants in this territory are preparing to suspend one or more departments around July 1 for repair and overhauling. The Republic Iron & Steel Co. is arranging to suspend operation of its Bessemer department and a number of bar mills at the Brown-Bonnell works.

Pittsburgh & Ohio Valley Railroad Declared a Common Carrier

WASHINGTON, June 19.—Passing upon the complaint of the Carnegie Steel Co. vs. the director general of the Pittsburgh & Ohio Valley Railroad, et al, the Interstate Commerce Commission, in a decision today, found the Pittsburgh & Ohio Valley to be a common carrier. This railroad, like the complainant, is a subsidiary of the United States Steel Corporation, and the stock of the carrier is owned by another steel corporation subsidiary, the American Steel & Wire Co.

The commission also held to be unlawful the assessment of demurrage by the Pittsburgh & Ohio Valley's trunk line connection on cars moving to and from Neville Island, Pa. The commission found that rates to and from the blast furnace at Neville Island leased by the Carnegie company from the American Steel & Wire Co. were unreasonable and unduly prejudicial, and awarded reparation.

The defendants, including the Pittsburgh & Ohio Valley, were required to establish not later than Sept. 15 rates on interstate traffic, except ore and movements in connection with the trunk lines at switching rates moving to and from points of loading or unloading at the Neville Island furnace and ore moving to points in the plant at which this product is customarily turned over to the Carnegie company for movement to the unloading points, no higher than those contemporaneously maintained to and from Neville Island. The commission held that delivery of ore to the Pittsburgh & Ohio Valley did not constitute delivery to the industry and the line haul service was not completed with the setting of the ore cars on the interchange tracks of that railroad.

German Iron and Steel Market Chaotic

Labor Restless on Part Time Work as Mark Declines—Prices Rise Rapidly but Not Enough to Offset Exchange—Industrial Reparations Guarantee Hedged with Conditions

(*By Radiogram*)

BERLIN, GERMANY, June 18.—Foundry iron No. 1 is held by the Pig Iron Association at 1,619,000 m. per metric ton, as last week, but the gold price has fallen from $20.35 per gross ton, at 1.23¾c. per 1000 m., to $11.51, at 0.7c. per 1000 m. This compares with 774,000 m. ($12.97 at 1.65c.) three weeks ago.

Ingots have been advanced by the Stahlbund to 2,415,000 m. ($17.17) from 1,847,000 m. ($23.22) last week and 1,271,000 m. ($21.30) three weeks ago.

Steel bars are now quoted at 3,400,000 m. (1.08c. per lb.), compared with 2,600,000 m. (1.46c. per lb.) last week and 1,755,000 m. (1.31c. per lb.) three weeks ago.

Thin steel sheets have been advanced to 5,460,000 m. (1.73 c. per lb.) from 4,171,000 m. (2.34c. per lb.) last week and 2,818,000 m. (2.11c. per lb.) three weeks ago.

BERLIN, GERMANY, June 5.—The heavy advances in prices have led to strikes and riots in different parts of the country, disturbances in the Ruhr district being especially violent. Unemployment and part time work were partly responsible for the discontent, but the constant depreciation of the mark and the inadequacy of remuneration are the chief reasons for dissatisfaction. Trouble in the mining and engineering industries has been settled by an adjustment of wages. Miners received an increase of 52 per cent, advance payments being made to enable the workmen to purchase food. The agreement comes into force in the coal and lignite industry on the Ruhr, and a special award is given for other districts. There are wage differences in various other industries and several large strikes are threatening.

Prices Continue Upward

As a result of the recent decline in the mark, more orders have been placed but employment shows only a slight improvement. The rise in coal has caused an advance of about 15 per cent in prices for rolled iron and steel, and the following table shows the current quotations of the Steel syndicate:

	Basic Bessemer Per Metric Ton	Open-Hearth Per Metric Ton
Ingots	1,847,000	2,171,000
Blooms	2,076,000	2,440,000
Billets	2,210,000	2,598,000
Sheet bars	2,282,000	2,682,000
Structural shapes	2,582,000	2,975,000
Bar iron	2,600,000	3,000,000
Hoop iron	3,170,000	3,606,000
Wire rods	2,769,000	3,197,000
Sheets, U. S. gage, No. 6 and heavier	2,930,000	3,394,000
Nos. 6 to 11	3,286,000	3,762,000
Nos. 12 to 20	3,814,000	4,290,000

Pig iron prices have also been raised and are now as follows in marks per metric ton:

Hematite	1,630,000
Foundry iron No. 1	1,600,000
Foundry iron No. 3	1,597,000
Foundry, Luxemburg quality	1,587,000
Spiegerland steel making	1,594,000
Spiegeleisen 8 to 10 per cent	1,674,000
Malleable pig iron	1,630,000
Steel making iron poor in copper	1,630,000

Iron blown in with imported fuel is quoted considerably higher; hematite at 2,069,000 m.; foundry iron No. 1, 2,039,000 m.; foundry iron No. 3, 2,036,000 m.; and foundry iron Luxemburg quality, 2,026,000 marks per metric ton. Scrap prices are chaotic and even quotations of firms in the same district vary considerably. They are closely following the fluctuations in the exchange and are also stiffened by the advances in iron. Under these conditions business is difficult and is largely a matter of speculation. The present price outside the Ruhr district is about 1,000,000 marks per ton, an advance of 100 per cent since April.

Drastic Price Control Contemplated

Under existing conditions, some traders and manufacturers have advanced prices unduly. This is reacting on wages and is strongly influencing the economic situation. A new Government order, which is to give greater powers to local authorities to deal with such conditions and to keep prices at a reasonable level, is under consideration by the Federal Council and if passed by this body will come into force this month. Maximum prices may be fixed for all goods, and municipalities may supply their citizens direct with certain commodities. The order would give municipalities the authorty to enter into contracts a trader may have concluded and to appoint agents to sell at fixed prices and under specific conditions. Traders may also be forced to report their stocks and all contracts made for certain products and to turn over these goods to the municipal authorities against payment. If this is refused the goods may be confiscated. The authorities may use the traders' or manufacturers' premises against payment of rent and demand information, especially as to prices, stock and production. The new order vastly increases the power of the local boards for fixing maximum prices, but it is doubtful whether the municipalities will make extensive use of it, as supplies have invariably decreased as soon as the action of these boards became rigorous.

Some Causes of Mark Depreciation

The Reichstag has appointed a committee to inquire into the failure of the action to stabilize the mark, and Mr. Havenstein, the president of the Reichsbank, has been heard. He declared that the failure of the gold mark loan was partly responsible for the drop in the mark that followed. The Reichsbank succeeded in holding the exchange value of the mark at about 20,000 marks to the dollar until the end of March, but as soon as it became known that only about one-fourth of the gold loan had been obtained all considerations were abandoned, and foreign exchange was generally bought in excess of the normal requirements of industry. He discounted, however, the accusation that the iron industry had frustrated the efforts of the Government by not taking up an adequate amount of gold loan bonds, and stated that the largest amounts were signed by this industry. The protest of the French Government has also influenced the amount of gold bonds taken up. The action for stabilization had been instituted for political reasons, and the tremendous issues of new paper money had been an obstacle from the start. The value of German imports being in excess of exports is also depressing the value of the mark.

Upper Silesian iron and steel producers met at Gleiwitz, and it was pointed out that the prices fixed by the German Pig Iron Association (Roheisenverband) left no margin of profit for the Upper Silesian works because of the improvement in the Polish exchange and the comparatively higher prices of Polish Upper Silesian coal.

The Polish iron industry, exclusive of East Upper Silesia, had from 5 to 7 blast furnaces operating during 1922, compared with 11 in 1913. Scarcity of coke was given as the chief reason for the low production.

Reparation Guarantee of German Industry

The Federal Association of German Industry has sent a letter, which is signed by Stinnes, Thyssen, Siemens, Vögler and others, to the Chancellor, accepting part of the guarantee for the reparation payments, stipulating certain conditions. It states that 500,000,000

gold marks could be guaranteed jointly by the landed proprietors, industrialists, traders and bankers as a mortgage on immovables for 30 years and that the industry would accept responsibility for 40 per cent of that amount. This is, however, provided State undertakings are conducted on private business lines to increase their rentability; that the State is, in principle, not producing or distributing any goods; that war measures, rationing, and export control are abandoned; that greater freedom is permitted in dealing with employees, including the abolition of all demobilization measures; and that the State is to interfere in trade disputes only as arbitrater. The proposal of the association is, however, meeting considerable opposition, the offer being regarded as inadequate and the conditions as excessive. Agricultural interests have also declared their readiness to accept part of the guarantee, but have stipulated similar conditions.

The Minister of Finance has issued a new order to the effect that goods from the occupied area which are reimported via another country by unoccupied Germany are free from duty and require no import permission. Importation of rolled iron and steel free of duty is to be extended for another two months.

A new Austrian Mannesmann Tube company has been founded in Graz under the auspices of the German Mannesmann Tube Co. and the Wutte concern. A special company is being established at Hamburg to deal with the export trade and other Wutte interests in Germany. The export of the Wutte company has been going entirely through Mediterranean ports, but a large amount is to be diverted to Hamburg now.

EXPORT MARKET QUIET

More Tenders for Rails from Japan — Belgian Competition in Foreign Markets Keen— Foreign Iron to Pacific Coast

NEW YORK, June 19.—No change in the export situation is reported. A fair volume of inquiry continues from South American markets, small tonnages generally being specified. The Japanese and Chinese merchant markets are still quiet, most of the current business being from large interests or governmental sources. At present, rails and tin plate are the most active items in Japanese business. In addition to the tenders on rails previously reported, the Imperial Government Railways have been receiving bids on about 8000 tons of 60-lb. sections. The 5300 boxes of oil can tin plate for the Ogura Oil Co. was awarded to the Mitsubishi Shoji Kaisha, New York. No action is as yet reported on the 9000 boxes of oil can tin plate for the Nippon Oil Co., but it is believed that the tonnage will be supplied partly from stock in warehouses in Japan and partly by British sellers.

Export of bars, plates and structural material seems impossible at present in view of the low quotations now being submitted by Belgian sellers, who are reported to be offering such material at from $46 to $48 per ton, c.i.f. Japanese port, compared with the current American price, based on about 2.40c. per lb., Pittsburgh, of $66 or $67 per ton, c.i.f. port.

While Scotch and continental irons are in most cases too high to compete with the American product on the Atlantic coast, importers report the sale of small lots of foundry iron to Pacific Coast consumers. One importer of foreign iron recently closed on about 300 tons of Scotch foundry iron No. 3, for shipment to the Pacific Coast at $34.25, c.i.f., duty paid. This importer has quoted as low as $31.75 per ton, c.i.f. Atlantic port, duty paid, for the same iron, but reports no business. An importer of continental iron reports the sale of a few hundred tons of French foundry iron at $34 per ton, c.i.f. Pacific port, duty paid.

Caucasian manganese ore is still quoted at 48c. per unit for washed ore and 42c. per unit for ordinary, c.i.f. port. A selling agent for Caucasian manganese ore in the United States reports the sale of 6000 tons to a central Pennsylvania furnace, previously the purchaser of about 7000 tons. A contract involving about 50,000 tons of Indian manganese ore is reported to have been entered into by an interest, which is purchasing on an f.o.b. Indian port basis and handling the shipments itself.

Wheeling Steel Corporation Bond Issue

The Wheeling Steel Corporation has completed negotiations with Dillon, Read & Co. and Redmond & Co., New York, for the underwriting of $8,000,000 of 6 per cent three-year convertible notes. The notes are dated July 1 and will be convertible into bonds. The issue is to reimburse the corporation for money spent in plant improvemnts and extensions over the past two years.

British Pig Iron and Steel in May

LONDON, ENGLAND, June 17 (*By Cable*).—A new record for the year for pig iron output was made in Great Britain in May at 714,200 gross tons. This compares with 652,200 tons in April, the previous high for this year. The May production of steel ingots and castings was 821,000 tons, which compares with 749,400 tons in April. The May record in pig iron compares with an average in 1920 of 669,500 tons per month, and the May record in steel with 755,600 tons per month in 1920. The present rate of output, however, largely exceeds the 1921 or 1922 rate in both pig iron and steel.

Comparative data for the British steel industry in gross tons per month are as follows:

	Pig Iron	Steel Ingots and Castings
1913, per month	855,000	639,000
1920, per month	669,500	755,600
1921, per month	217,600	302,100
1922, per month	408,300	486,000
1923, January	567,900	634,300
1923, February	543,400	707,100
1923, March	633,600	802,500
1923, April	652,200	749,400
1923, May	714,200	821,000

Will Ask Suspension of Proposed Rates

BIRMINGHAM, ALA., June 19.—The Southern Traffic Bureau, representing traffic associations of Southern cities, has filed a petition for suspension of the commodity rates ordered in effect by the Interstate Commerce Commission July 1. In case suspension is allowed, different communities will file sundry suggestions for their advantage. Attack on the general bearing of the new schedule is not under consideration, the lower inbound charges conforming to the long and short haul close rates and establishing much lower freights. Port and river cities will probably ask for reduction from the new high rates imposed on them by reason of abrogation of their water-borne rail rates. Different communities will display different attitudes.

Rolling Stock to Be Purchased by Reading Railroad Co.

WASHINGTON, June 19—Application was made today by the Reading Railroad Co. to the Interstate Commerce Commission for authority to assume obligation and liability in respect of $6,000,000 of 5 per cent equipment trust certificates to be sold at par, the proceeds to be used in buying 2000 coal cars, 90 passenger coaches, 10 combination passenger and baggage cars, 5 baggage cars and 25 locomotives, estimated to cost $7,004,000. The certificates are to be bought by the Philadelphia & Reading Railroad and other subsidiaries of the Reading company.

Portland cement production in May, estimated by the Geological Survey at 12,910,000 bbl., broke all records, displacing the high mark of 12,287,000 bbl. established last October. Shipments in May, at 14,257,000 bbl., were exceeded only by the 14,361,000 bbl. of last August. Revision of the figures places the 1922 total production at 114,789,984 bbl. and shipments at 117,701,216 bbl.

AUSTRIAN CONDITIONS IMPROVE

Ruhr Occupation Brought Heavy Business, but Mark Decline vs. Crown Increase Is Obstacle —Less Unemployment—Wages High

VIENNA, AUSTRIA, June 6.—The activity in Austria's steel industry, which resulted from the Ruhr occupation shows signs of ending. Large German orders were placed at first for pig and semi-finished materials, steel rails and machines and the Austrian Alpine Montan-Gesellschaft (controlled by Hugo Stinnes) was even offered premiums for prompt delivery. Such orders soon declined, partly because of German agitation and partly because the expected German famine in steel and iron did not occur. The new mark decline makes it doubtful that Austria will be able to deliver to Germany at all. The much depreciated crown, which, at par 81 German pfennigs, was lately quoted in Berlin as high as 112 (today 103) pf. and as Austrian prices, even with the depreciated crown, have been higher than German, they are now even greater. Austrian industry profited greatly from the Ruhr occupation. The unemployed, who at the end of February numbered 168,147 (Vienna and vicinity 97,800) had declined by May 15, to 122,352, (Vienna and vicinity 75,841). The practical stabilization of the crown exchange has renewed confidence, as is shown by the increase in bank deposits and savings deposits. At the close of September, 1922, deposits in banks totaled only 31,000,000,000 crowns, about 2,000,000,000 gold crowns, but by the end of March, 1923, deposits had increased to 224,000,000,000 crowns (about 15,000,000 gold crowns).

Wages in Austria, when reduced to a gold basis are much higher than in Germany. The last official report (for March) shows in the metal industries an increase since 1914 of 7402 fold for skilled workers and 9335 for unskilled. In the same month German wages had risen 2361 fold, the German mark exchange being then depreciated only about one-third of the crown's depreciation. Austrian statisticians calculate that at the beginning of June, with the dollar at about 70,000 marks, Austrian gold wages in the heavy iron and steel industry were 62.7 per cent higher than German wages. With such wage costs, Austria can deliver to Germany only if the German need is so pressing that prices cease to be a consideration.

Austria's production of fuel, pig iron and steel in 1922 showed a considerable improvement. In the main the fuel demand was met by importation, consisting in 1922 of 4,019,435 tons of coal, 1,403,813 tons of brown coal and 386,533 tons of coke. Of the whole supply of 9,084,000 tons of mineral fuel (allowing for a small export) 3,739,000 tons were consumed by industry. The output of pig iron in 1922 was 322,822 tons against 226,077 tons in 1921. Although a great improvement has taken place since 1920, when the output was only 100,010 tons, the production is still far below the 606,655 tons of 1913. In steel production 296,965 tons of pig iron and 194,567 tons of scrap were consumed. The steel production was 480,514 tons, of which 442,657 tons was open-hearth steel. The report of the Alpine Montan-Gesellschaft, by far the greatest producer in Austria, shows a remarkable recovery in 1922. The company's production (in metric tons) was:

	1922	1921
Coal	889,900	682,300
Ore	1,084,000	679,300
Pig iron	314,200	214,300
Ingots	297,500	198,700
Rolled products	200,100	132,000

Average production of the Alpine works was 40 per cent below that of a normal pre-war year. The *Berliner Tageblatt* declares that the recent purchase of control of the Silesian Bismarckhuette and Kattowitz companies by the Stinnes' Rhine-Elbe Union is to be completed by the transfer of shares in these companies to the Alpine Montan-Gesellschaft which, although a Stinnes interest, is outside the union. Half of the new Alpine shares will be taken over by a syndicate in which the Niederoesterreichische Escompte Bank and Anglo-Austrian Bank will be represented. If this report is confirmed, the two Silesian companies will really fall under control of an international syndicate.

The negotiations over the former state-owned Woellersdorf concern have not yet been concluded. The Vienna Arsenal steel works passed in February under control of the German Aquila A. G. of Frankfurt-on-Main. The Aquila A. G. is an important company with coal mines, iron and steel works, machine shops, chemical and other interests under direction of Albert Rothschild. The Arsenal steel works was closed at the time of acquisition. The Otto Wolf interests of Cologne, which lately obtained concessions in Russia, have of late been active in the Danube countries.

LARGER COKE PRODUCTION

May Statistics Show Increase for Both By-product and Beehive Grades

WASHINGTON, June 19.—The output of by-product coke in May was 3,328,000 net tons, an increase of 122,000 tons or 3.8 per cent, over the April output, says the Geological Survey. This gain was partly due to the greater number of working days and partly to an increase in the average daily rate of production. The quantity of coke produced was 89.2 per cent of the capacity of plants in existence. The total count of plants is now 69, two formerly reported separately having been consolidated. Of these, 63 were active and six idle.

The production of beehive coke also increased in May. The output was 1,829,000 net tons, as compared with 1,776,000 tons in April. Thus the total output of all coke was 5,157,000 tons, of which by-product coke constituted 64.5 per cent and beehive coke 35.5 per cent.

Monthly output of by-product and beehive coke in the United States, exclusive of screenings and breeze, in net tons follow:

	By-Product Coke	Beehive Coke	Total
1917 Monthly average	1,870,000	2,764,000	4,634,000
1918 Monthly average	2,166,000	2,540,000	4,706,000
1919 Monthly average	2,095,000	1,638,000	3,733,000
1920 Monthly average	2,565,000	1,748,000	4,313,000
1921 Monthly average	1,646,000	462,000	2,108,000
1922 Monthly average	2,374,000	669,000	3,043,000
March, 1923	3,256,000	1,749,000	5,005,000
April, 1923	3,206,000	1,776,000	4,982,000
May, 1923	3,328,000	1,829,000	5,157,000

According to report from the Ore and Coal Exchange a total of 1,140,561 net tons of soft coal was dumped over Lake Erie piers in the week ended June 10, against 1,103,255 tons in the week preceding. Of the total dumpings, 1,089,211 tons was cargo coal and 51,350 tons vessel fuel. The cumulative total from the opening of navigation to June 10 was 6,841,488 net tons. This is a decrease of 1 per cent compared with 1921, but 158 per cent and 173 per cent larger than in 1922 and 1920, respectively.

Imports and Exports of Merchandise

WASHINGTON, June 19.—Preliminary figures of the Department of Commerce covering the first 11 months of the fiscal year ending June 30 indicate that the total of imports for the entire fiscal year will not be far from $3,800,000,000. Similarly, the exports will apparently be not far from $3,950,000,000. Imports are thus larger than for any fiscal year in our history except that ended June 30, 1920, when the total was $5,238,352,114. In the calendar year 1920 the total reached $5,278,481,490. Exports have been exceeded in preceding years by the figures of the fiscal years 1916, 1917, 1918, 1919, 1920 and 1921. For the first time in many years however, the imports are very close to the value of exports. In fact, for the first six months of the calendar year 1923 the imports will exceed the exports by a substantial amount, the figures for the first five months showing imports of $1,766,000,000 and exports of $1,628,000,000.

Less Tonnage in Iron and Steel Imports

April Shows Large Drop from March, Due to Cutting of Pig Iron Inflow in Half—More Tin Plate Than for Several Months

WASHINGTON, June 19.—Showing a decline of 28,294 gross tons, imports of iron and steel in April totaled 77,903 tons, valued at $3,129,185, compared with 106,197 tons in March. The decrease in imports of pig iron was even greater than the difference between total

Imports of Iron and Steel into the United States
(In Gross Tons)

	April, 1922	April, 1923	Ten Months Ended April 1922	Ten Months Ended April 1923
Pig iron	5,968	36,371	30,146	585,489
Ferromanganese	2,380	6,053	12,411	93,393
Ferrosilicon	456	1,168	8,905	15,098
Scrap	4,430	22,755	33,677	192,395
Steel ingots, blooms, billets, slabs and steel bars	1,442	1,262	14,333	24,076
Rails and splice bars	3,149	2,917	19,557	17,602
Structural shapes	160	1,290	1,134	9,239
Boiler and other plates*	....	5	....	1,503
Sheets and saw plates	11	105	271	844
Bar iron	203	1,237	2,602	8,800
Tubular products*	....	528	....	2,559
Castings and forgings*	....	302	....	1,071
Nails and screws*	....	118	....	599
Tinplate	144	3,268	208	9,310
Bolts, nuts, rivets and washers*	....	17	....	121
Wire rods	69	29	1,054	2,451
Round iron and steel wire*	....	315	....	2,101
Flat wire and strip steel*	....	149	....	641
Wire rope and insulated wire, all kinds*	....	14	....	376
Total	18,412	77,903	124,298	967,668
Manganese ore	25,559	14,071	166,362	258,557
Iron ore	2,710	171,459	100,794	1,614,779
Magnesite	10,443	5,879	54,493	93,669

*Not reported separately previous to Sept. 22, 1922.

April and March imports, amounting to 35,973 tons. Pig iron imports in April were only 36,371 tons, compared with 72,344 tons in March. Except for pig iron and ferromanganese, increases were shown in imports in April in most of the important items, when compared with those of March. Imports of ferromanganese in April were 6053 tons, against 8082 tons in March.

The April figures showed an extremely heavy movement of tin plate, when compared with the normal imports. Incoming foreign shipments of this product in April totaled 3268 tons, of which 3185 tons were credited to England and apparently originated in Wales. The remaining shipments were from France, which provided 80 tons, while three tons came from Canada. The April total was more than half as great as all that came in during the preceding nine months. The United Kingdom led as the source of total imports in April with 32,637 tons. Canada ranked second with a total of 20,231 tons.

Imports of Machinery and Vehicles

	April 1922	April, 1923	Ten Months Ended April, 1922	Ten Months Ended April, 1923
Metal-working machine tools and parts	$10,797	$19,483	$147,963	$305,009
Agricultural machinery and implements	381,963	361,538	1,156,459	2,107,279
Electrical machinery and apparatus*	.....	23,863	.....	165,906
Other power generating machinery	.....	265,924	.....	1,795,707
Other machinery	234,704	226,776	2,677,534	2,030,577
Vehicles, except agricultural	91,116	234,668	1,376,501	1,627,663
Total	$718,580	$1,132,252	$5,358,457	$8,032,141

*Beginning Sept. 22, 1922.

Of the total iron and steel imports for the 10 months ended with April, amounting to 967,668 tons, valued at $33,605,313, pig iron, scrap and ferromanganese constituted 871,277 tons, or 90 per cent. Of the pig iron imports in April, 21,224 tons came from England, while out of the total pig iron imports for the 10-month period, amounting to 585,489 tons, shipments from England were 256,801 tons and from Scotland 109,914 tons. Cuba is credited as the source of 4100 tons of pig iron

Imports of Iron and Steel in Gross Tons
(Monthly Average)

	Total Imports	Pig Iron	Ferro-alloys	Manganese Ore and Oxide*
1909 to 1913, incl.	26,505	†14,132	....	....
1914 to 1918, incl.	23,351	4,645	3,281	‡47,155
1919 to 1921, incl.	23,901	5,708	3,710	37,115
1922	59,545	31,954	9,117	31,204
January, 1923	120,078	83,935	5,120	829
February	67,704	35,793	9,234	4,636
March	106,197	72,344	9,030	12,799
April	77,903	36,371	7,221	14,071

*Not included in "total imports."
†Includes ferroalloys.
‡Average for three years, 1916 to 1918, only.

in April, being the only tonnage of this kind credited to that country during the 10-month period. The only attempted explanation at this unusual movement is that

Imports of Scrap by Countries
(In Gross Tons)

	April, 1923	Ten Months Ending April, 1923
Canada	16,161	139,875
Cuba	5,443	27,454
Panama	622	5,229
Germany	303	853
England	176	12,293
Mexico	50	295
Dominican Republic	....	159
Virgin Islands, U. S.	....	354
British West Indies	....	2,716
Spain	....	3
Scotland	....	877
Peru	....	1,586
France	....	500
Sweden	....	201
Total	22,755	192,395

the 4100 tons probably represents foundry iron which was exported to Cuba and returned to the United States.

Of the 192,395 tons of imports of scrap during the

Imports of Pig Iron by Countries
(In Gross Tons)

	April, 1923	Ten Month Ended April, 1923
England	21,224	256,801
France	6,789	95,762
Cuba	4,100	4,100
Canada	1,539	35,924
Germany	1,369	20,584
British India	1,000	1,000
Scotland	250	109,914
China	100	602
Belgium	....	57,182
Netherlands	....	2,537
Sweden	....	784
Austria	....	299
Total	36,371	585,489

10 months, 139,875 tons came from Canada. England, of course, has provided the vast bulk of imports of ferromanganese, receipts of this alloy from that country in April amounting to 6049 tons. The remaining four tons came from Sweden.

Of the 2917 tons of rails imported in April, 1558

Leading Sources of Iron and Steel Imports by Countries in April Compared with March
(In Gross Tons)

	April, 1923	March, 1923
United Kingdom	32,637	44,215
Canada	20,231	27,661
Cuba	9,545	4,496
France	7,145	16,784
Germany	3,591	7,205
Belgium	1,906	4,734
British India	1,000	....
Sweden	698	656
Panama	622	1
All others	528	447
Total	77,903	106,197

tons came from Germany, 798 tons from Canada, 496 tons from Belgium and 65 tons from the Netherlands. Imports of iron ore in April totaled 171,459 tons, of which 63,669 tons came from Sweden.

Imports of agricultural machinery in April, with a

Imports of Iron Ore by Countries
(In Gross Tons)

	April, 1922	April, 1923	Ten Months Ended April, 1922	Ten Months Ended April, 1923
Spain	....	....	15,758	72,182
Sweden	....	63,669	27,817	432,537
Canada	....	224	3,740	2,265
Cuba	....	38,800	47,147	516,588
Other countries	2,710	68,766	6,332	591,207

total of $361,538, reached a high total when compared with those of March with a value of only $67,508. At the same time, metal working machine tools dropped to $19,483 in April, as compared with $93,582 in March.

Unsatisfactory Conditions of French Iron and Steel Industry

WASHINGTON, June 19.—Conditions in the French iron and steel industry are unfavorable, even granting that Ruhr coke deliveries from Germany will be sustained at the rate indicated by governmental reports until August, which the trade considers doubtful, says a cablegram received by the Department of Commerce from Commercial Attache Chester Lloyd Jones, Paris. Trade publications state that reports of Ruhr shipments are received with skepticism. Complaints are being made in French industrial circles that the supplies of coke during May were inferior to those of April, due partly to the strike at the Dunkerque docks and the Belgian railroads and to the order to hoard deliveries from the Ruhr.

In April the Societe des Consommateurs de Coke des Hauts-Fourneaux delivered to its members 112,000 tons of German coke, giving its members 49 per cent of the amounts allotted to them at the basic-requirements price of 198 francs per ton. Shipments of Ruhr coke to the Societe from May 1 to May 24 were 115,000 tons. The price set by the Societe will be lowered for June and July to 180 francs per ton for basic requirements and 250 francs for supplementary supplies.

On May 1 there were 88 blast furnaces operating, showing an improvement in the East and Lorraine. Eighty-five furnaces were ready to go into blast and 46 were under construction or repair. French production of iron and steel was 350,000 tons of pig iron and 350,000 tons of steel ingots and castings in March. Exports of pig iron, amounting to 202,000 tons during the first quarter of 1923, are now declining and offerings on the local market have been larger since March, Mr. Jones reports, but supplies are insufficient for the normal demand. Buyers of steel are declared to be cautious, but purchases are increasing and it is said there is a possibility of a quick change in the market.

The annual meeting of the Newark Foundrymen's Association will be held on Wednesday evening, June 20, at the Downtown Club, Kinney Building, Broad and Market Streets, Newark. Officers for the coming year will be elected. The apprenticeship plan will also come up for adoption.

LABOR IN GERMANY

Effects of the Short Day Vital Economic Factor at Present Time

WASHINGTON, June 19.—Despite the lack of any statistical basis for such a conclusion, there seems to be little doubt that the shorter working day has decreased the productivity of German industry since the revolution, says a report on "Labor, Wages and Unemployment in Germany" prepared by Assistant Trade Commissioner M. L. Goldsmith, Berlin, and just issued by the Bureau of Foreign and Domestic Commerce, as a trade information bulletin. Mr. Goldsmith states that it is generally estimated that present production is about 70 per cent of the pre-war German output. He declares that it is difficult to determine the extent to which this decreased production is due to the shorter working day, or to what extent other factors, such as deterioration of machinery and less efficient transportation facilities, have been the cause. Such statistics as are published concerning the actual effect on production of the 8-hr. day are all influenced, Mr. Goldsmith says, by the particular interest represented and cannot be accepted as objective statements of the problem.

It is conceded, however, that German labor has never before been so vital as an economic factor as at present. It is stated that it is to the renewed energy on the part of its workers that Germany is looking for the solution of a great measure of its acute industrial problems. In his summary, Mr. Goldsmith says:

"The chief benefits derived by labor from the new order of things created by the Revolution of 1918 have been the acquisition of an unlimited right to organize, together with full protection and recognition of the labor unions as economic units by the Federal Constitution of 1919. The result of this new privileged position has been a steady growth of the unions and an increasing solidarity and influence of labor, both politically and economically. Other new advantages of the German workers are representation of labor on the factory councils and the general 8-hr. day.

"Labor has not yet realized the possibilities for actual industrial control granted by various sections, such as the factory-council clause, of the new constitution. Except by the revolutionary groups, there seems to be little tendency among German workers to take over managerial functions generally or to destroy the present industrial system. This is due in the first place, of course, to the natural stolidity of, and habitual acceptance of the present system by, German labor, but very largely also to the apparent effort on the part of labor leaders to direct the labor movement in constructive and reconstructive channels."

Serious Conditions

In view of the foregoing the following statement regarding the serious German labor situation, received last week by the Department of Commerce, is of added interest:

"German unemployment statistics for the beginning of May indicated the existence of a more serious condition in the German labor market than had existed at any time since the Revolution in 1918 when the army was demobilized, says Commercial Attache C. E. Herring in a cable to the Department of Commerce. Early in May unions with a membership of 6,000,000 reported 7 per cent totally unemployed, as compared with 6.2 per cent in January, 1919, and 5.9 per cent early in April of this year. The tobacco trades reported 32 per cent unemployed; the building trade, 11 per cent; metal workers, 6.5 per cent; and woodworkers, 7.1 per cent. The increase in part time work as regards the number of workers has also affected a number of plants working less than half-time. Early in May unions including 5,000,000 members reported 28.5 per cent on part time, as against 24.2 early in April."

Governor Ritchie of Maryland has appointed Robert H. Carr chairman of the State Industrial Accident Commission as successor to Robert E. Lee, who died June 9.

Iron and Steel Markets

MILL SHUTDOWNS COMING

Record Operations for Many Weeks Compel Repairs

Steel Corporation a Buyer of Sheet Bars—Pig Iron Declines Further

A number of steel companies have taken orders in June at a greater rate than in May, buying for third quarter being on a scale pointing to well sustained operations for many weeks. Consumption and prices show but fractional change.

With little holding up of deliveries and notably few cancellations, summer weather is the only present limitation on mill output. But it is likely that a further reduction will come early in July. The heavy driving of the past six months will require more than ordinary repairs at a number of plants and workers will welcome a holiday. In anticipation of these shutdowns shipments are being accelerated in some cases and railroads have been giving extraordinary dispatch.

In the Pittsburgh and Valley districts five or six blast furnaces are likely to be put out in the near future for relining after long and hard campaigns.

An indication of the continued large scale of consumption is the recent purchase of semi-finished steel by the Steel Corporation. From independent makers of sheet bars it is understood that 20,000 to 30,000 tons of sheet bars were bought.

A significant price reduction is that in sheet bars. Three Central Western mills have named $42.50 as their price for the third quarter, as against $45 for the second quarter.

In finished steel, while an occasional instance of a concession on one of the major products—plates, shapes and bars—is reported, the contract basis of 2.50c. for the first two and of 2.40c. for bars is unchanged. On these prices the Pennsylvania Railroad closed for upward of 10,000 tons in the past week. A New York Central inquiry is for the repair of 2000 cars.

Automobile output will not be greatly curtailed in July, but some makers have reduced specifications, in order to carry a smaller stock of frames and other parts.

Several Detroit makers have bought large lots of body sheets for third quarter in the past week, including upward of 20,000 tons for the Ford Motor Co.

Smaller demand for oil country pipe is expected in view of the latest reduction in crude oil, and the call for storage tanks, while larger, is not sufficiently compensating.

Concessions on sheet mill prices continue. At Cleveland, weakness has developed in warehouse sheets. One jobber has reduced galvanized sheets $2 and black sheets $3 a ton, but as low as 5.40c. on galvanized sheets is reported.

Structural steel awards during the week were somewhat more than 16,000 tons, and pending inquiries, totaling nearly 11,000 tons, include a 5000-ton building for Japan. In May the bookings of fabricators were 131,000 tons, or 58 per cent of capacity, against an average of 190,000 tons in the first four months of the year.

Rail steel reinforcing bars are lower in Ohio due in part to the activity of a mill that recently resumed operations.

Prices of foundry pig iron have declined from $1 to $2 a ton from recent nominal quotations in the Pittsburgh district and at Chicago prices have been reduced $1 without developing business. Sales of several thousand tons of Alabama iron on a basis of $25, Birmingham, have established the price at that figure, although important furnaces are still holding at $27. In the East the market has been extremely quiet, the only noteworthy transaction being the purchase of 15,000 to 20,000 tons, about half domestic and half foreign irons, by a cast-iron pipe company.

May showed a record consumption of Lake Superior iron ore at 6,118,540 tons, as against 5,587,300 tons in April, which was also a record.

The deal for the importation of 50,000 tons of Indian manganese ore by the Steel Corporation was helped by the fact that the corporation's own vessels will have return cargoes from the Orient.

Recent imports of foundry iron from India amount to 5000 tons, of which 4000 tons came to the Pacific Coast and 1000 tons to Philadelphia. The price in India plus $5.50 freight would be not far from $23 c.i.f. Further negotiations for Indian iron are reported. High phosphorus Luxemburg iron has been offered at $24.50, Atlantic seaboard.

The British steel industry is showing more gain from the Ruhr situation. Its exports were 424,500 tons in May, which shows that the 1913 rate at last has been recovered. May steel output at 821,000 tons was the greatest for the year and last month's pig iron output at 714,000 tons was the largest since 1913.

Pittsburgh

Pig Iron Prices Decline Sharply — Hot Weather Affects Mill Operations

PITTSBURGH, June 19.—Entrance into the pig iron market as sellers, of steel makers whose costs are much less than those of the merchant producers has brought a marked price recession in cases where this competition has been a factor.

Uncertainty as to the operating outlook has caused a good many pig iron producers to refrain from covering their third quarter coke requirements, and it is now fairly established that more than half of the production of the Connellsville district for that period is unsold. The coke market is weak. The coal market shows no rallying power because there are still a great many more sellers than buyers. These factors, in combination with the weakness in scrap in part explain a perceptible weakening in the semi-finished steel market. These conditions have not encouraged a change of buying policy by steel consumers.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 19, 1923	June 12, 1923	May 22, 1923	June 20, 1922
No. 2X, Philadelphia‡	$30.76	$30.76	$32.76	$27.32
No. 2, Valley furnace†	*27.00*	29.00	30.00	24.00
No. 2, Southern, Cin'ti†	*29.05*	29.55	31.05	23.00
No. 2, Birmingham, Ala.†	*25.00*	25.50	27.00	18.50
No. 2 foundry, Chicago*	*31.00*	32.00	32.00	23.50
Basic, del'd, eastern Pa.	28.14	28.14	30.00	25.00
Basic, Valley furnace	27.50	27.50	27.50	25.00
Valley Bessemer, del. P'gh	*30.27*	30.77	31.27	26.96
Malleable, Chicago*	*31.00*	32.00	32.00	23.50
Malleable, Valley	*28.00*	29.00	30.00	24.50
Gray forge, Pittsburgh	*28.27*	30.27	31.27	25.46
L. S. charcoal, Chicago	36.65	36.65	36.65	29.00
Ferromanganese, furnace	*125.00*	130.00	130.00	67.50
Rails, Billets, etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$40.00
Bess. billets, Pittsburgh	42.50	42.50	45.00	35.00
O.-h. billets, Pittsburgh	42.50	42.50	45.00	35.00
O.-h. sheet bars, P'gh	*42.50*	45.00	45.00	35.00
Forging billets, base, P'gh	*47.50*	52.50	55.00	40.00
O.-h. billets, Phila	50.17	50.17	50.17	40.74
Wire rods, Pittsburgh	51.00	51.00	51.00	38.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.45	2.45	2.45	1.70
Light rails at mill	2.25	2.25	2.25	1.50
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.72	2.72	2.825	1.96
Iron bars, Chicago	*2.50*	2.60	2.60	1.75
Steel bars, Pittsburgh	2.40	2.40	2.40	1.70
Steel bars, Chicago	2.60	2.60	2.74	1.75
Steel bars, New York	2.74	2.74	2.74	1.98
Tank plates, Pittsburgh	2.50	2.50	2.50	1.60
Tank plates, Chicago	2.80	2.80	2.84	1.75
Tank plates, New York	2.84	2.84	2.84	1.98
Beams, Pittsburgh	2.50	2.50	2.50	1.60
Beams, Chicago	2.70	2.70	2.84	1.75
Beams, New York	2.84	2.84	2.84	1.98
Steel hoops, Pittsburgh	3.30	3.30	3.30	2.40

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	June 19, 1923	June 12, 1923	May 22, 1923	June 20, 1922
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	3.85	3.85	3.85	3.15
Sheets, galv., No. 28, P'gh	5.00	5.00	5.25	4.15
Sheets, blue an'l'd, 9 & 10	3.00	3.00	3.25	2.40
Wire nails, Pittsburgh	3.00	3.00	3.00	2.40
Plain wire, Pittsburgh	2.75	2.75	2.75	2.25
Barbed wire, galv., P'gh	3.80	3.80	3.80	3.05
Tin plate, 100-lb. box, P'gh	$5.50	$5.50	$5.50	$4.75
Old Material, Per Gross Ton:				
Carwheels, Chicago	*$21.50*	$22.00	$23.00	$18.25
Carwheels, Philadelphia	23.00	23.00	24.00	17.00
Heavy steel scrap, P'gh	*21.00*	21.50	21.50	17.00
Heavy steel scrap, Phila.	18.00	18.00	19.00	15.00
Heavy steel scrap, Ch'go.	*17.50*	18.00	19.00	14.50
No. 1 cast, Pittsburgh	*23.50*	24.50	25.50	18.50
No. 1 cast, Philadelphia	22.00	22.00	24.00	19.00
No. 1 cast, Ch'go (net ton)	*21.50*	22.00	22.50	15.75
No. 1 RR. wrot., Phila.	23.00	23.00	24.00	17.00
No. 1 RR. wrot., Ch'go (net)	15.50	15.50	16.50	12.50
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$4.75	$4.75	$5.00	$6.50
Foundry coke, prompt	5.50	5.50	6.00	7.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	**15.37½**	15.25	15.75	13.75
Electrolytic copper, refinery	**14.87½**	14.75	15.25	13.50
Zinc, St. Louis	*6.00*	6.15	6.75	5.37½
Zinc, New York	6.35	6.50	7.10	5.72½
Lead, St. Louis	6.95	7.00	7.00	5.60
Lead, New York	7.25	7.25	7.25	5.85
Tin (Straits), New York	*40.25*	42.00	41.75	31.37½
Antimony (Asiatic), N. Y.	6.75	6.75	7.00	5.10

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price June 19, 1923, Finished Steel, 2.789c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

June 12, 1923,	2.789c.
May 22, 1923,	2.789c.
June 20, 1922,	2.141c.
10-year pre-war average,	1.689c.

Composite Price June 19, 1923, Pig Iron, $28.21 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

June 12, 1923,	$28.46
May 22, 1923,	29 04
June 20, 1922,	24.05
10-year pre-war average,	15.72

While here and there the report is that new business shows a slight gain, it is also a fact that manufacturers are not claiming that new bookings are yet anywhere nearly approximating deliveries against old orders. Briefly, it may be said that both the mills and their customers are sustained by present contracts.

The automotive industry is not taking much steel at present because that industry as a general rule ends its fiscal year on June 30 and now is engaged in inventory taking. Reports from Detroit are that the demand for automobiles shows no slackening, but with most makers preparing for new models, the manufacture of new dies and other preparations for the new season are getting more attention than steel specifications.

Another cut of 25c. a barrel in Pennsylvania crude oil yesterday, which probably will mean lower prices in all other grades throughout the country, is rather dampening to the hope of a good demand for oil country pipe over the last half of the year. The decline in oil probably will mean more demand for storage tanks, although local makers had no recent inquiries of any consequence. A factor which has been partially overlooked is the keen competition for business by the railroads, which is resulting in unusually rapid deliveries. Chicago lately has been enjoying 48-hr. freight service out of Pittsburgh and Youngstown, and it is reported that one railroad recently took some business in Sharon on a promise of delivery of tank parts in Texas in four days. Railroad service has been helped not only by the small movement of coal so far this year, but by the big additions to the equipment.

There are the usual reports common in markets like the present one of price cuts, but on the whole it must be said that deviations are not great, nor are they general, while only small tonnages are involved as a rule. Tank builders claim to have been offered steel at 2.40c. and black sheets are said to have been offered as low as 3.70c., but it is extremely difficult to verify either report.

Finishing mill operations are beginning to suffer from the loss of labor incident to summer weather, but steel works and blast furnace operations show no material decline, although it is probable that in the next two weeks as many as six blast furnaces in this and nearby districts will go down.

Pig Iron.—Recent appearance of an inquiry for 500 tons of foundry iron by a local melter clearly indicated the tendency of the market. This inquiry was easily the largest single one received here in the past six weeks, and competition for the order was extremely keen. The business was placed at $27, Johnstown, for No. 2 grade. This sale seems to have "cut the cloth" for Valley furnaces and although most of the latter are asking $28 for this grade, at least one producer went to $27 on a small sale to one of the glass companies in this district. The Valley market on foundry iron now is quotable from $27 to $28 for No. 2, with the usual differential of 50c. a ton up and down with every half per cent in silicon contents. This range represents a decline of $1 to $2 a ton from last week's nominal quotation. Bessemer iron dropped 50c. a ton on sales of a few hundred tons at $28.50, Valley furnace. It is impossible to make any change in the price of basic iron because there is not enough demand to disclose the price at which business could be done. The most recent sales of this grade involving about 5000 tons of standard grade were at $27.50 and a lower quotation has not yet been made, although steel makers with surplus stocks have intimated that they would consider less. In the absence of either a definite offer of iron at a lower price or a firm bid which would indicate the ideas of buyers, we quote the market on the basis of the last sales. The market also is nominal on malleable iron and the recent asking price of $36 at Valley furnace for copper free low phosphorus iron is out of the question, since Eastern makers are quoting considerably less. The recent inquiry for 100 tons of this grade was closed at $35.42, delivered, which is equivalent to $33.65, Valley furnace.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.77 per gross ton:

Basic	$27.50
Bessemer	28.50
Gray forge	$26.50 to 27.50
No. 2 foundry	27.00 to 28.00
No. 3 foundry	26.50 to 27.50
Malleable	28.00
Low phosphorus, copper free	35.00

Ferroalloys.—Ferromanganese now is quoted at $125, furnace or seaboard, by both domestic producers and importers for all deliveries, prompt or deferred. The quotation of $120, which some were making on fourth quarter tonnages, has been withdrawn, but this step is not impressive, nor are consumers here convinced that they would have to go higher if they wanted supplies of domestic material for that period. Some importers have tonnages due in July, which they are a little anxious about in view of the fact that consumers are well protected against their needs for the next few months and at prices so well below $125, seaboard, as to be uninterested in additional supplies at that price. Spiegeleisen is nominal at unchanged prices, because there is so little demand to test the market. Of 50 per cent ferrosilicon there is almost no new buying, and it can be had here without much trouble at $90, delivered. Weakness in foundry iron may be expected to show in prices of Bessemer ferrosilicon and silveries before long. Prices are given on page 1813.

Alloy Steel.—Shipments are running well ahead of new orders and specifications and the consequent inroads upon unfilled tonnages make producers a little more eager for new business. There has been no change in prices other than a reappearance of the quantity differentials. In the S. A. E. series, No. 3100, $4.50, is the ruling price, and the higher quotation on this, as well as other grades, refers to small lots. The regular price of $80.00 per gross ton for 4-in. nickel chromium billets is reported to have been shaded. Large buyers are not called upon to pay more than the inside or lower prices given on page 1813.

Semi-Finished Steel.—Several makers who are planning a shutdown of their sheet mills over the first two weeks of July for vacations and mill repairs, do not expect to curtail steel production and are seeking an outlet for the output of that period. As low as $42.50 has been named by some producers on such tonnages, but even at that figure there is not much demand, as most non-integrated mills have ample supplies to meet their requirements for the next month and with the suspension ahead, present supplies will carry them well into August. The market is pretty definitely down to $42.50 on rolling billets and slabs and the past week has brought a rather sharp drop in the price of forging billets; the highest price recently paid in this district was $50 on a small tonnage and an inquiry for a fair-sized tonnage disclosed at least one company willing to take the business at $47.50. The ordinary differential between rolling and forging billets is $5 a ton. As there are no early delivery demands for wire rods worth noting, sales above the regular base of $51 no longer amount to much; buyers regard that price as rather stiff in view of the fact that sales of finished products at premium prices no longer are easy. The skelp market is exceedingly quiet, as far as pipe makers are concerned, but a good deal of tonnages still is being taken and sought by the makers of disk wheels for automobiles. Prices are given on page 1813.

Wire Products.—There has been no material letdown in the demand for nails and plain wire also still is wanted, but seasonable dullness rules in other products. Makers in this district report that a shortage of labor is keeping down production, but evidently by concentrating on nails and wire the mills are satisfying their customers to a greater extent than recently because premiums for delivery have disappeared. Some of the smaller producers, who recently were restricting their bookings to specific orders for prompt delivery, now find themselves rather poorly supplied with business. Prices are given on page 1812.

Steel Rails.—With coal mine operations at a low rate because of a dull market, demand for light rails still is very limited. Some makers of these sections rolling them from billet or standard rail crops are quoting as high as 2.35c. base, but sales above 2.25c. are practically unknown and rerolled light rails can be bought $1 to $2 a ton less.

We quote 25 to 45-lb. sections, rolled from new steel, 2.25c. base; rolled from old rails, 2.15c. to 2.20c. base; standard rails, $43 per gross ton mill for Bessemer and open-hearth sections.

Tubular Goods.—Specifications against the tonnages already on mill books are coming in well as a general proposition, but new business continues very moderate. Suspension of so much building construction and the postponement of home building have not yet materially affected shipments, but are reflected in the demand for forward delivery. News from the oil industry is not encouraging for the last half of the year with regard to pipe requirements. Practically all mills are steadily catching up with their orders and promises of delivery are being advanced. Little of the tonnage of steel pipe on makers' books carries today's prices. Discounts are given on page 1812.

Sheets.—Current business is of moderate volume, but generally there is pretty close observance of the regular market prices. There are slight deviations, particularly on the part of those mills which during the early part of the year elected to take orders instead of contracts, and now find themselves without much of a backlog tonnage. It is said, however, that only a small amount of tonnage is involved at the cut prices, which represents recessions of $1 to $2 a ton from the regular prices. Galvanized sheets are easier to obtain because the decline in the price of spelter, which amounts to more than 1c. per lb. from the peak level of the fore part of the year, makes business attractive at the present spread between black and galvanized sheets. If there has been any decline in sheet mill operations lately, it is due to a shortage of labor rather than a scarcity of steel. Prices are given on page 1812.

Tin Plate.—Container manufacturers are specifying freely and leading makers in this and nearby districts have as yet had no suspensions or cancellations. On the contrary, a number of can makers, especially the smaller ones lacking sufficient storage capacity, now are trying to add to their original orders. The market is quotable at $5.50 per base box, Pittsburgh, for production tin plate with the usual price preferentials to preferred customers.

Cold-Finished Steel Bars and Shafting.—The most interesting development in connection with this product

is the announcement by a leading maker of hot-rolled bars that the extra of $3 a ton announced several weeks ago on screw stock quality bars, as of July 1, will apply to all hot-rolled bars for cold-finishing. The original announcement would not have embraced shafting and this fact promised to be embarrassing to cold-finished steel bar makers, since buyers would have insisted that their orders be classified as shafting. There is a fair amount of new business and some contracting for third quarter in cold-finished steel bars, but the volume of new business still is less than the deliveries on old orders. There is close observance of the quoted price of 3.25c. base, Pittsburgh, for carload lots. Ground shafting is unchanged at 3.65c. base, f.o.b. mill for carload lots.

Hot-Rolled Flats.—Slight concessions are appearing in band prices, this product now being obtainable from some mills at 3.25c. base, Pittsburgh. The regular price on hoops and hot-rolled strips in the ordinary gages and widths holds at 3.30c. base, with the usual discount of $3 a ton on hot-rolled strips for cold rolling, and for automobile rim stock. Most makers have fairly heavy order books, but new business is not keeping pace with completed obligations. Prices are given on page 1812.

Cold-Rolled Strips.—There are no important deviations from the regular market price of 5.25c. base, Pittsburgh, as the mills are pretty well supplied with business and they are not inclined to force sales, since specifications are coming along in satisfactory fashion, and some curtailment of production is likely on account of the summer shortage of labor.

Bolts, Nuts and Rivets.—Practically all makers of bolts and nuts are now publicly quoting the prices for either prompt or third quarter shipments at which the bulk of the second quarter business was taken. This represents a reduction of about 10 per cent, and there is ample evidence that prices published since March 1 have not been adhered to. The bolt market now is quoted on a basis of 50 and 10 per cent off list, but there has been some recent business at 50, 10 and 10 per cent off list. Inquiry is reported to be good, but actual business is moderate, as buyers are feeling their way carefully until satisfied that prices are firm. Prices above $3.25, base, per 100 lb. for heavy structural and ship rivets refer only to less carload lots. Prices and discounts are given on page 1812.

Track Fasteners.—Track bolts are weaker, large ones now being obtainable at $4, base, per 100 lb., and the larger sizes at $5, base. Makers of spikes have plenty of business in standard railroad spikes and in boat and barge spikes, but have pretty well run out of orders for small railroad spikes. The spread between large and small railroad spikes now amounts to $12 a ton, which is exceptionally large. At the beginning of 1922, all sizes had a common base price. A drop in the price of small spikes would be a natural development. Prices are given on page 1813.

Iron and Steel Bars.—Makers of iron bars, on account of increased labor costs, are not disposed to shade recent prices, although buying is on a lighter scale than it was recently. In fact, on double-refined bars, local mills are endeavoring to establish a 5c. base as the minimum price. Steel bars are held firmly at 2.40c. by all makers in this district, but not much business is coming out at that figure, as buyers are well covered by contracts and are depending largely on deliveries against these contracts.

We quote soft steel bars, rolled from billets, at 2.40c., base; bars for cold-finishing of screw stock analysis, $3 per ton over base; reinforcing bars, rolled from billets, 2.40c., base; refined iron bars, 3.25c. base, in carload lots or more f.o.b. Pittsburgh.

Structural Material.—The need of new business is not yet urgent enough for mills to shade the regular market price of 2.50c. Most of the awards to local fabricating shops are for small tonnages, and they probably would be larger if better delivery promises than four to six months, the ruling promise, could be made. Evidently there is not quite the urgency for small jobs there was recently because premiums for early deliveries on such jobs have disappeared. Plain material prices are given on page 1812.

Plates.—Mills here and in nearby districts claim to be holding firmly to 2.50c., base, Pittsburgh, and a Youngstown maker the past week took one order for 1800 tons at that figure. There are some cases, however, where business recently taken at 2.60c., Pittsburgh, has been revised to 2.50c. Some buyers claim to have been offered plates at 2.40c. Prices are given on page 1812.

Coke and Coal.—The market as a whole is very weak. It is no longer necessary for blast furnace interests seeking spot tonnages of furnace coke to go above $4.75 per net ton ovens, and there are unconfirmed reports that such tonnages have been offered as low as $4.60. Oven operators generally quote $5, but this is more of a negotiation than a selling price. The contract market on furnace coke is at a standstill, and with a very large part of the third quarter production of several high grade brands still available, it is probable that late comers will fare much better on prices than did the early buyers. Producers are quoting $5.50 for third quarter tonnages, but undoubtedly will consider less, although a strike of the anthracite mines might create a demand for coke as a substitute and result in higher prices. Spot foundry coke still is quotable from $5.50 to $6 per net ton ovens, and some $6.25 to $7 on last half contract. The coal market is weak at $1.75 to $2 per net ton at mines for mine run steam coal and from $2.25 to $2.35 for mine run gas and coking coal for spot delivery, while steam slack sold at $1.25 to $1.30 and gas slack at $1.40 to $1.50. Such contracts as have been made for gas and coking coal lately have carried a maximum price of about $2.50 for mine run grades.

Old Material.—Reaction in prices still is unchecked. There is little mill buying, and dealers, having pretty well caught up with their short sales, are not buying except at prices low enough to tempt speculative purchases. Melters bought heavily when the orders for finished material were heavy to insure themselves of sufficient supplies; in many cases, they overbought to the extent of 50 to 100 per cent. Shipments now are flowing in so freely that a good many points are congested and shipments held up by embargoes, while several consumers have cancelled tonnages not delivered by the end of a contract period. Heavy melting steel is selling in small lots out of dealers' yards at $21 to $22 and uncut rails have sold at $20. Preparation of the latter for melting, however, involves an expense of about $1 a ton. On strictly heavy melting grade the market is quotable at $21 to $22. Sales of what is called heavy melting steel have been made at $20 to a West Virginia mill, but that is a very high price for the kind of material that will be shipped and the actual settling price will be several dollars a ton less, since shippers expect rejections on the ground of quality and ship with an idea of making a settlement to effect acceptance. Declines in other grades of material average fully $1 per ton, with the market really weak on cast scrap and turnings and blast furnace grades. One mill here will not pay over $18 for heavy breakable cast and its bid on turnings is $16.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

Per Gross Ton	
Heavy melting steel	$21.00 to $22.00
No. 1 cast, cupola size	23.50 to 24.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	22.00 to 22.50
Compressed sheet steel	19.00 to 20.00
Bundled sheet sides and ends	18.00 to 18.50
Railroad knuckles and couplers	23.50 to 24.00
Railroad coil and leaf springs	23.50 to 24.00
Low phosphorus standard bloom and billet ends	25.50 to 26.00
Low phosphorus, plates and other grades	24.50 to 25.00
Railroad malleable	23.50 to 24.00
Steel car axles	23.50 to 24.00
Cast iron wheels	22.50 to 23.00
Rolled steel wheels	23.50 to 24.00
Machine shop turnings	16.50 to 17.00
Heavy steel axle turnings	18.00 to 18.50
Short shoveling turnings	17.50 to 18.00
Cast iron borings	18.00 to 18.50
Heavy breakable cast	19.00 to 20.00
Stove plate	16.50 to 17.00
Sheet bar crop ends	25.00 to 25.50
No. 1 railroad wrought	18.00 to 18.50

Chicago

Reduction of $1 Per Ton in Pig Iron Fails to Develop Business—More Tank Orders

CHICAGO, June 19.—Buyers continue to mark time in the belief that prices will settle to lower levels. A reduction of $1 a ton in pig iron by local furnaces has failed to bring out business, while there have been no new developments in finished steel prices, with buying generally light. Oil tank awards, however, promise to be a feature of the market, as over-production of crude oil is stimulating the erection of storage facilities. An order for 26 tanks just placed involves 4300 tons of plates. A Government purchase of 10 river barges requires 1100 tons of steel. Fabricating awards and inquiries are in fair number, although involving small tonnages.

Hot weather is causing defections in labor ranks, with the result that the steel industry finds it difficult to maintain its high rate of production. The operations of the Inland Steel Co.'s sheet mills have declined to 60 per cent of capacity, but its general average for all steel departments is still 75 per cent. The Illinois Steel Co. remains on a 94 per cent basis, with all of its 27 steel works stacks in blast. Lay offs by labor because of the heat are not confined to the mills. Among consumers some of the automobile manufacturers are commencing to hold up shipments of coke, pig iron and other materials, owing to lack of men to sustain their high production schedules.

Pig Iron.—Local furnaces have reduced prices $1 a ton to $31, base, without stimulating sales. A Southern furnace has sent out circulars announcing a price of $25.50, base Birmingham, to govern deliveries from July through October. Other Southern producers are still holding to $27, base, which is apparently a purely nominal quotation. Current orders are few and range from carload lots to 100 or 200 tons. A Michigan melter is expected to enter the market for 1000 tons of silvery. A local user has purchased 250 tons of 10 per cent silvery at a substantial concession. In view of the weakness of electrolytic material, the quotations on blast furnace silvery are nominal. The melt of iron in this district is holding up well, although the approach of inventory taking on July 1 has caused some suspension of shipments. Automobile accessory manufacturers who have been exceedingly busy for months are commencing to curtail their operation because of the inability of automobile makers to maintain their high rate of production. This slowing down in the output of cars, it is said, is not due to lack of orders but to voluntary lay-offs by the men either because of unwillingness to work during the hot weather or a desire for recreation. A Wisconsin melter is in the market for 200 tons of low phosphorus.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumers' yards or, when so indicated, f.o.b. furnace other than local:

Lake Superior charcoal, averaging sil. 1.50, delivered at Chicago	$36.65
Northern coke, No. 1 sil. 2.25 to 2.75	31.50
Northern coke, foundry No. 2, sil. 1.75 to 2.25	31.00
Malleable, not over 2.25 sil	31.00
Basic	31.00
High phosphorus	31.00
Southern No. 2	$31.51 to 33.01
Low phos., sil. 1 to 2 per cent, copper free	37.00 to 38.00
Silvery, sil. 8 per cent (nominal)	44.29

Ferroalloys.—The alloys are quiet, and while it is intimated that as low as $120 seaboard could be done on an attractive inquiry for ferromanganese, the market remains untested. Spiegeleisen is not quotable at over $53.58, delivered.

We quote 80 per cent ferromanganese, $130.56 for all deliveries; 50 per cent ferrosilicon, $95, delivered; spiegeleisen, 18 to 22 per cent, $53.58, delivered.

Rails and Track Supplies.—No new rail orders are reported and it is believed that the major buying movement for 1924 will not start until late in August or early in September. Current inquiries for track materials are confined to small lots.

Standard Bessemer and open-hearth rails, $43; light rails, rolled steel, 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 3.25c. mill; track bolts with square nuts, 4.25c. mill; iron tie plates, 2.85c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.90c. base and track bolts, 4.90c. base.

Plates.—The Phillips Petroleum Co. has placed 26 tanks involving 4300 tons with a Southwestern fabricator. Other oil storage business is pending. The Government has awarded five river barges to the Rock Island Bridge Co. and an equal number to the Dubuque Boat & Boiler Works. Eleven hundred tons of steel will be required. Railroad car buying remains very light. Mill prices are firm and unchanged and while new buying is restricted, specifications against old orders are heavy and cancellations are notably few.

The mill quotation is 2.60c. to 2.80c., Chicago. Jobbers quote 3.30c. for plates out of stock.

Structural Material.—Activity in the construction field is showing surprising momentum despite the recent postponement of considerable contemplated work. Fabricating lettings and inquiry involving small tonnages are numerous, but few large projects are being undertaken. Railroads continue to be conspicuous as buyers of fabricated steels, not only for work reported in the lists published elsewhere, but for many small improvements requiring less than 100 tons each. Mills are receiving heavy specifications for plain material, but find new business light. Prices are firm and unchanged.

The mill quotation on plain material is 2.60c. to 2.70c. Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

Bars.—The market is quiet so far as new business is concerned, but specifications are heavy and cancellations and suspensions are almost unknown. Farm implement manufacturers are hopeful for the future and a number have advanced their prices 10 per cent. The automobile industry continues to operate at a high rate and it would appear that if any slowing down in production has occurred it has been confined to makers of high-priced cars. Among miscellaneous consumers of steel, activity is well maintained, and their caution in buying steel is explained, in part, by the fact that new orders for their products are slow in coming in. Prices of soft steel bars are firm. Demand for hard steel bars is heavier, particularly from the implement industry, although considerable tonnage continues to go into fence posts and reinforcing bars. Price concessions have disappeared and the market is again firm at 2.30c., mill. New business in bar iron has been meager during the week and at least one mill is now taking orders at 2.50c.

Mill prices are: Mild steel bars, 2.50c. to 2.60c., Chicago; common bar iron, 2.50c. to 2.60c., Chicago; rail steel, 2.30c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4.55c. for rounds and 5.05c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 3.15c. base; hoops, 4.55c.; bands, 3.95c.

Sheets.—Occasional price concessions continue to be reported, but most mills are deterred from abandoning the present market because of the high price of sheet bars and their inability to operate economically during the hot months. The local independent which is booked several months ahead is unable to operate its mills at over 60 per cent of capacity.

Mill quotations are 3.85c. for No. 28 black, 3c. for No. 10 blue annealed and 5c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4.35c. for blue annealed, 5.20c. for black and 6.35c. for galvanized.

Cast Iron Pipe.—Sustained buying promises to bring this half-year close to the record for tonnage booked. Conspicuous among the orders recently taken is 8400 tons of 6 to 16-in. pipe bought by Portland, Ore., from the United States Cast Iron Pipe & Foundry Co. Bis-

marck, S. D., has placed 1500 tons with the American Cast Iron Pipe Co. Pending business includes:

Long Beach, Cal., 3000 tons of 30-in., bids taken.
Midvale, Utah, 850 tons, bids taken.
Harrington, Kan, 750 tons, bids to be taken June 19.
Woodward, Okla., 500 tons, June 23.
Gridley, Ill., 450 tons of 4- to 8-in., June 26.
Painesville, Ohio, County work, 800 tons, June 19.
Little Chute, Wis., 300 tons of 6- to 12-in., June 19.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $64.20; 6-in. to 12-in., $60.20; above 12-in., $58.20 to $59.20; class A and gas pipe, $5 extra.

Bolts and Nuts.—Third quarter contracting is proceeding in an orderly manner although buyers are not showing any particular haste in covering for their needs. Current orders are light and specifications are not so heavy as a month or two ago. The discounts of March 1 continue to govern business in this territory.

Jobbers quote structural rivets, 4c.; boiler rivets, 4.10c.; machine bolts up to ¾ x 4 in., 45 and 5 per cent off; larger sizes, 45 and 5 off; carriage bolts up to ¾ x 6 in., 40 and 5 off; larger sizes, 40 and 5 off; hot pressed nuts, squares and hexagons, tapped, $2.50 off; blank nuts, $2.50 off; coach or lag screws, gimlet points, square heads, 50 and 5 per cent off.

Wire Products.—Specifications against old orders are heavy, but new business is light, as is generally the case at this season. The summer lull is expected to last until August when the fall demand will set in. Conditions in the South point to good business from that quarter, but demand from other agricultural sections will depend on the crops yet to be harvested and the prices the farmers obtain for them. Mills are handicapped by a scarcity of skilled help as well as by the hot weather. The leading interest is operating at less than 80 per cent of capacity. For mill prices see finished iron and steel f.o.b. Pittsburgh, page 1812.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, $3.95 per 100 lb.; cement coated nails, $3.40 per keg.

Warehouse Prices.—The reduction in cold-rolled steel bars and shafting announced by local jobbers last week was shortlived and the old prices have been restored. The quotations now in force are published under the bar paragraph. Warehouse business is running along at an even pace and shows less curtailment than buying from the mills. This is probably explained by the fact that much of the material bought from store is used to fill in on projects now under way for which the mill steel was bought some time back.

Reinforcing Bars.—Business in reinforcing bars shows surprising buoyancy despite indications of contraction in new building activity. It is to be noted, however, that railroad work and highway construction account for a considerable portion of the tonnage involved in recent lettings. Sellers expect that orders from these two sources will take most of the reinforcing steel available from local mills for several months to come, even if other building work ceases. Although dealers have been forced to place contracts with local mills for their third quarter requirements at advanced quotations, it is hardly likely that the local warehouse quotations on concrete bars will go up proportionately. Activity in the reinforcing field has been fairly well sustained in this district, but the same cannot be said of other market centers. The warehouse quotation at Pittsburgh is now 2.75c., or the equivalent of 3.09c. delivered, Chicago.

Lettings include:

Chicago, Burlington & Quincy, Canal Street viaduct, Chicago, 400 tons to Corrugated Bar Co.

Sherwin Hotel, Chicago, 300 tons of rail steel to Inland Steel Co.

Western Electric Co., Hawthorne, Ill., buildings 14B and 14C, 270 tons to Concrete Steel Co.

Hotel, Waukesha, Wis., 200 tons to Corrugated Bar Co.

Illinois State highway work, 200 tons to Kalman Steel Co.

Oklahoma road work, 200 tons to Corrugated Bar Co.

Illinois State highway work, 150 tons to Concrete Steel Co.

Northwestern Packing Co. plant, Chicago, 100 tons to Truscon Steel Co.

Ford Motor Co. plant, Iron Mountain, Mich., 100 tons to Truscon Steel Co.

Bryant Paper Co. plant, Kalamazoo, Mich., 100 tons to Truscon Steel Co.

Pending work includes:

Medical school and hospital, University of Rochester, Rochester, N. Y., 1500 tons.

Liberty Memorial building, Kansas City, Mo., 700 tons.

Headhouse and concourse, Union Station Co., Chicago, 250 tons, taking of bids postponed to June 21.

Bridge, Belle Plaine, Kan., 250 tons, to be readvertised.

Interurban terminal, Kansas City, Mo., 500 tons, to be readvertised.

St. Louis & San Francisco Railway terminal at Lindenwood, near St. Louis, 100 tons.

Old Material.—Prices continue to decline and the market is so soft that it is difficult to ascertain its true level. All factors appear to favor continued weakness. Consumer buying is exceedingly light and offerings of scrap by the railroads and industries are heavy. Heavy cancellations of old orders by the leading mill have accentuated the excess of supply over demand. The Rock Island offers 4500 tons and the Santa Fe 3500 tons, while the Illinois Central will take bids on 16,000 tons for delivery by August 31.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton	
Iron rails	$22.00 to $22.50
Cast iron car wheels	21.50 to 22.00
Relaying rails, 56 and 60 lb.	28.50 to 29.50
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Rolled or forged steel car wheels	22.50 to 23.00
Rails for rolling	19.00 to 19.50
Steel rails, less than 3 ft.	20.00 to 20.50
Heavy melting steel	17.50 to 18.00
Frogs, switches and guards cut apart	17.50 to 18.00
Shoveling steel	17.25 to 17.75
Drop forge flashings	13.50 to 14.00
Hydraulic compressed sheets	16.00 to 16.50
Axle turnings	15.50 to 16.00
Per Net Ton	
Iron angle and splice bars	23.00 to 23.50
Steel angle bars	17.00 to 17.50
Iron arch bars and transoms	23.00 to 23.50
Iron car axles	27.50 to 28.00
Steel car axles	20.50 to 21.00
No. 1 busheling	14.50 to 15.00
No. 2 busheling	11.50 to 12.00
Cut forge	15.50 to 16.00
Pipes and flues	11.50 to 12.00
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	15.50 to 16.00
Steel knuckles and couplers	20.00 to 20.50
Coil springs	21.50 to 22.00
No. 1 machinery cast	21.50 to 22.00
No. 1 railroad cast	19.75 to 20.25
No. 1 agricultural cast	19.75 to 20.25
Low phos. punchings	17.50 to 18.00
Locomotive tires, smooth	16.50 to 17.00
Machine shop turnings	10.50 to 11.00
Cast borings	12.50 to 13.00
Short shoveling turnings	12.50 to 13.00
Stove plate	15.00 to 15.50
Grate bars	14.00 to 14.50
Brake shoes	15.00 to 15.50
Railroad malleable	21.00 to 21.50
Agricultural malleable	20.50 to 21.00

Detroit Scrap Prices Lower

JUNE 19.—The scrap market is very soft and dealers are showing anxiety to move stocks on their yards. Melters are holding off buying their requirements on pig iron and scrap for the third quarter as long as possible. Prices are $1 below last week's quotations on all grades except No. 1 machinery cast.

The following prices are quoted on a gross ton basis f.o.b. cars, producers' yards, excepting stove plate, automobile and No. 1 machinery cast, which are quoted on a net ton basis:

Heavy melting steel	$17.50 to 18.50
Shoveling steel	17.50 to 18.50
No. 1 machinery cast	22.00 to 24.00
Cast borings	13.50 to 14.50
Automobile cast scrap	24.00 to 26.00
Stove plate	18.00 to 19.00
Hydraulic compressed	16.50 to 17.00
Turnings	13.00 to 14.50
Flashings	12.75 to 13.25

The American National Co., Toledo, Ohio, manufacturer of children's vehicles, has closed negotiations for the purchase of the plant and business of the Toledo Metal Wheel Co., which manufactures a similar line of products. Frank E. Southard has resigned as president of the latter company and W. L. Diemer, president of the American National Co., will be president of the combined plants. The capital stock of the American National Co. will be increased from $1,000,000 to $2,000,000.

New York

Foreign Pig Iron Offered at Low Prices Fails to Interest Buyers

NEW YORK, June 19.—The pig iron market continues to drag, while the long expected and hoped for buying movement for the third quarter fails to develop. The largest sale reported is 1000 tons of foundry iron for July delivery to a New Jersey melter. Some resale iron is still on the market on which concessions are made, but furnaces are adhering pretty well to recent quotations. The principal form of concession is to sell No. 2X at the same price as No. 2 plain, but the ordinary differential is usually adhered to in the case of No. 1X. Inquiries include 1000 tons for last half from a Connecticut foundry, 500 tons of malleable for early delivery for a car company and 500 tons additional for the Ingersoll-Rand Co. An inquiry, indefinite as to tonnage, is for No. 2 plain and No. 2X for September to December delivery. Sellers are pointing out that the present situation as to stocks is very different from that of 1920 and 1921, and also that financial conditions of furnaces are not, as a rule, such as to require them to make sacrifice sales. It is conceded that if buyers continue to stay out of the market prices will recede. The expectation is that after a short period of recession there will be an advance. An effort is being made to sell foreign iron in the United States and the French product is being offered at $27.50, c.i.f. New York, duty paid, for an iron equivalent to No. 2X, but melters are not showing any disposition to buy foreign iron.

We quote delivered in the New York district as follows, having added to furnace prices $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25	$33.27
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	31.27
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	31.27
Buffalo, sil. 1.75 to 2.25	$33.41 to 33.91
No. 2X Virginia, sil. 2.25 to 2.75	33.94 to 34.44
No. 2 Virginia, sil. 1.75 to 2.25	32.94 to 33.44

Ferroalloys.—The 500 tons of ferromanganese, noted as before the market a week ago, was sold and this constitutes the only large sale last week. Other sales and inquiries are limited to carload and small lots for filling-in purposes for such consumers as need them. Most large consumers are evidently well provided for by contracts. Demand for spiegeleisen is also confined to carloads in small lots and there have been a few sales of imported alloy which commands about $50, duty paid, or a premium of about $5 per ton over the domestic alloy. Imports of ferromanganese in April were 6053 tons and of manganese ore only 14,071 tons. The imports of ore thus far this year have been the smallest in many years according to official statistics. The 50 per cent ferrosilicon market is exceedingly quiet with new business confined to carload and small lots, the minimum price in this market being reported at $92, delivered.

Coke.—The coke market shows little change, with standard foundry for prompt shipment in lots of a few carloads at $5.50 to $6.50 per ton and contracts, $6.75 to $7.50 per ton. Quotations on standard furnace range from $4.75 to $5.75 for prompt shipment and there is very little contracting. The price of by-product coke is $12.34 to $12.41, Newark and Jersey City points.

Finished Iron and Steel.—The slight improvement in the demand for steel noted last week and the week previous has been due largely to a pick-up in building operations. Structural steel fabricators report that they are figuring on more work than at any time since the decline in building projects began early in April. The same holds true of those figuring on concrete reinforcing construction. Prices of plates, shapes and bars are holding at 2.50c., Pittsburgh, for the former two products and 2.40c., Pittsburgh, for bars. Some buyers of concrete reinforcing bars have given the impression to mill representatives that they have received quotations of 2.35c. for bars, but a careful check-up by the mills has failed to confirm such reports. About 400 tons of bars for the foundation of the new American Telephone & Telegraph Co. building was reported to have brought a quotation below 2.40c., but the mill charged with having made this quotation denies its correctness.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c. to 2.84c.; plates and structural shapes, 2.84c.; bar iron, 2.74c.

Warehouse Business.—There has been a slight decline in the volume of inquiries on most products. While there is some demand for structural steel, the tonnages involved are small. No change is anticipated in prices at present. Although tire steel is still unchanged at 3.60c. per lb., base, for iron finish, the smooth finish differential has been raised from 20c. to 50c. per 100 lb., increasing the price to 4.10c. per lb., a result of a similar change in the differential at the mill. Black and galvanized sheets continue weak with a strong tendency on the part of most warehouses to "meet competition," when necessary to get the business. A fair estimate of the present market is 4.75c. to 5.15c. per lb. base for black and 5.75c. to 6.15c. per lb. base, for galvanized. There is a fair demand for steel pipe and in addition to a shortage of some of the smaller sizes in many warehouse stocks dealers report poor deliveries of those sizes from the mills. The brass and copper market continues unchanged. We quote prices on page 1830.

Cast-Iron Pipe.—No diminishing of demand is evident at the higher prices now in effect, about $4 per ton. Makers also have increased the differential for Class A and gas pipe from $4 to $5 per ton, thus falling in line with other districts. The tonnage of water pipe for Marblehead, Mass., award of which has been in abeyance for some time, because of the poor delivery offered in the bids submitted, has been placed with the United States Cast Iron Pipe & Foundry Co. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $62.30; 4-in. and 5-in., $67.30; 3-in., $77.30, with $5 additional for Class A and gas pipe. Demand for soil pipe shows a slight improvement and with more demand the larger discounts, by 5 points, that have recently been obtainable, are beginning to be better established. We quote discounts of both Southern and Northern makers, f.o.b. New York, in carload lots, as follows: 6-in. standard, 13 to 20¾ per cent off list; heavy, 23 to 30¾ per cent off list.

Old Material.—The market is practically at a standstill this week. Prices being offered by dealers for shipment to eastern Pennsylvania consumers are generally considered too low to bring out any tonnage. On No. 1 heavy melting steel $18.50 to $19 per ton still prevails for delivery to eastern Pennsylvania. The price of specification pipe delivered to Milton, Pa., has been reduced to $14 per ton. Stove plate is still going forward in small lots to Harrisburg and Phoenixville, Pa., and some New Jersey foundries are again active with $16 and $16.50 per ton being paid for delivery to these consumers.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard	$14.50 to $15.00
Steel rails, short lengths, or equivalent	15.00 to 15.50
Rails for rolling	16.00 to 18.00
Relaying rails, nominal	25.00 to 26.00
Steel car axles	20.00 to 21.00
Iron car axles	25.00 to 26.00
No. 1 railroad wrought	17.00 to 18.00
Wrought iron track	16.00 to 16.50
Forge fire	12.75 to 13.25
No. 1 yard wrought, long	15.50 to 16.00
Cast borings (clean)	12.75 to 13.25
Machine-shop turnings	12.75 to 13.25
Mixed borings and turnings	12.75 to 13.25
Iron and steel pipe (1 in. diam., not under 2 ft. long)	10.50 to 11.00
Stove plate	12.75 to 13.25
Locomotive grate bars	13.00 to 13.50
Malleable cast (railroad)	20.00 to 21.00
Cast-iron car wheels	18.00 to 19.00

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$21.00 to $22.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	20.00 to 21.00
No. 1 heavy cast, not cupola size	18.00 to 19.00
No. 2 cast (radiators, cast boilers, etc.)	16.00 to 17.00

Cincinnati

Alabama Furnace Sells at $25—Buying in Small Lots Only

CINCINNATI, June 19.—An Alabama furnace was selling iron in this market Saturday at $25, base, and while the tonnage offered for third quarter is reported to be limited, the price has not been withdrawn, and is regarded as today's market. A Tennessee furnace was also booking at $25.50, Birmingham base, and is reported to have taken a fair number of orders from its regular customers. Other Southern furnaces are reported as being receptive to offers for third quarter iron. In the North the price remains at $28, Ironton basis, with some furnaces asking $29. In the central part of the State, Valley competition is being encountered, iron being offered at $27.50, Valley. There were no outstanding sales. A central Ohio melter is reported to have placed an order for 1000 tons at slightly under the market, for immediate shipment. Activity generally is confined to carload lots. Silveries are weak, and firm offers of carloads at $1 under the schedule are not being turned down. Bessemer iron has sold in small lots at $29, Ironton. There is no demand for basic. Norton furnace at Ashland has blown out.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$29.05 to $29.55
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	29.55 to 30.05
Ohio silvery, 8 per cent	40.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	30.27
Basic Northern	29.77
Malleable	30.27

Finished Materials.—More interest is being shown in last half contracts by jobbers and fabricators of steel. Included in the inquiries current are one for 2000 tons of plates and several for 500 tons of plates and shapes. The L. & N. Railroad closed for 500 tons of plates last week, the order going to a Southern mill. Current orders for bars, shapes and plates run generally from carload lots to 100 tons, and in many cases prompt shipment is asked. Deliveries are showing some improvement, and it is now possible to book orders for plates and shapes for six to eight weeks' delivery. Steel bars, however, are running about 10 weeks as far as delivery promises are concerned. Wire nails are in good demand for prompt shipment, and jobbers report shipments not coming in fast enough to care for the needs of the trade. Track accessories are in fairly good demand, and the L. & N. Railroad will close this week on 5000 kegs of spikes. Building activity has taken a spurt. In addition to a couple of small inquiries, lettings last week included two jobs totaling 1100 tons, besides 600 tons of tank work. The largest inquiry comes from a Birmingham jobber, and calls for 600 tons. Reinforcing bars are also becoming more active. A local railroad placed an order for 226 tons with the Bourne-Fuller Co., and inquiries are current for approximately 600 tons for road work in Kentucky and West Virginia. Bridge work in West Virginia, involving approximately 600 tons of structural steel, has been placed with a number of smaller fabricators. Prices are being very firmly maintained on all products, and no changes are reported since last week.

Warehouse Business.—Demand for stock out of warehouse continues active, even though some of the mills, particularly the sheet mills, are now quoting two to three weeks' delivery. Reinforcing bars and small angles are active, as well as blue annealed and galvanized sheets. Cold-rolled products are also moving in good shape. Nails are in heavy demand, and jobbers report difficulty in securing shipments from mills to take care of the trade. Prices are unchanged.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.50c.; cold-rolled flats, squares and hexagons, 5c.; No. 10 blue annealed sheets, 4.25c.; No. 28 black sheets, 5.35c.; No. 28 galvanized sheets, 6.35c.; No. 9 annealed wire, $3.60 per 100 lb.; common wire nails, $3.60 per keg base.

Coke.—There is little activity in the coke market, and June specifications are falling far behind May. Unexpected strength has developed in Wise County prices, and it is doubtful whether today standard foundry grades could be had less than $8. Furnace is quoted at $6.50. New River is unchanged at $13 to $14 for spot shipment, while Connellsville furnace is at $5.25 and foundry at $6.50.

Old Material.—There is no activity in the scrap market in this district, a few carload lots being the only sales reported. All steel plants are out of the market for the time being, and foundries are pretty well covered. Prices are weak, and with any dealings taking place would undoubtedly be from 50c. to $1 lower.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

Per Gross Ton	
Bundled sheets	$14.00 to $14.50
Iron rails	16.50 to 17.00
Relaying rails, 50 lb. and up	29.00 to 29.50
Rails for rolling	18.00 to 18.50
Heavy melting steel	17.00 to 17.50
Steel rails for melting	16.00 to 16.50
Car wheels	17.00 to 17.50
Per Net Ton	
No. 1 railroad wrought	13.50 to 14.00
Cast borings	12.50 to 13.00
Steel turnings	11.50 to 12.00
Railroad cast	18.00 to 18.50
No. 1 machinery cast	22.00 to 22.50
Burnt scrap	14.00 to 14.50
Iron axles	24.50 to 25.00
Locomotive tires (smooth inside)	14.50 to 15.00
Pipes and flues	11.50 to 12.00

Birmingham

Sales of Several Thousand Tons at $25 Fixes Market Price

BIRMINGHAM, ALA., June 19.—The Central Iron & Coal Co. has sold several thousand tons of iron in the North for third quarter delivery at the base of $25, and is on that base today. The tonnage consisted of 1.25 to 1.75 silicon, for which $24.50 was charged, and 1.75 to 2.25 silicon, the base, for which $25 was charged. Other Alabama operators heard of this transaction for the first time this morning, and have not met the cut. Apparently none of them has yet sold under $27 on the small tonnage going. The Central Iron & Coal Co. deal is the first one involving real tonnage since May 1, when the large pipe maker took 20,000 tons of fill-in iron at $27. The action of the Central Coal & Iron Co. makes it a $25 to $27 market today. The Sloss-Sheffield Steel & Iron Co.'s blowing in of its seventh active stack, the new Sheffield furnace, on Saturday, was accepted as indicating confidence of that largest Southern iron maker in the market. That company now has active capacity of 60,000 tons of iron a month and 25,000 tons will be available for river and rail movement via Tennessee River, thence by rail into St. Louis and Chicago territory at rates considerably under all-rail rates. This is a distinct advantage in competitive fields. Active Alabama stacks now include eight of the Tennessee company, one of Woodward Iron Co. and one of Gulf States Steel Co. on basic; seven of the Sloss-Sheffield Steel & Iron Co., three of the Woodward Iron Co., two each of the Republic Iron & Steel Co. and the Alabama Co., one of the Central Iron & Coal Co. and three of the Tennessee company on foundry; one of the Tennessee company on ferromanganese and Rock Run and Shelby on charcoal. Iron is moved as made and orders for anticipation of shipment are not infrequent.

We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, silicon 1.75 to 2.25	$25.00 to $27.00
Basic	26.00
Charcoal, warm blast	34.00

Cast Iron Pipe.—Some sanitary pipe is being piled. The market is inactive at $70. Pressure pipe is less active with base at $49 that is sometimes shaded. The American Cast Iron Pipe Co. has booked 631 tons for Seattle, 154 tons for Alliance, Ohio, and 600 tons for Sidney, Ohio. Ponce, Porto Rico, took a quantity of pipe fittings via Mobile last week.

Coal and Coke.—Coke has eased up a trifle for the first time in months. Contract coke rules at $8 to $9 and spot at $9 to $9.50. The Southern Railway placed a year's business of 1,400,000 tons last week, Pratt Con-

solidated Coal Co., Bankhead Coal Co. and Railway Fuel Co. getting the largest tonnages, the rest being scattered among a half dozen mines on the Southern Railway's Alabama right of way.

Finishing Mills.—Tennessee company rail mill is running at the rate of 35,000 tons a month. The Southern Pacific has placed 13,000 tons of rails. The Tennessee company's new bar mill has produced 175 tons a day. The Tennesee company's car works is turning out 25 new pressed steel cars a day. Virginia Bridge & Iron Co. is making 400 composite hoppers for the Seaboard Air Line. Steel bars are quoted at 2.65c. All steel mills are near capacity. Cotton tie production is active.

Old Material.—Old material has become listless for the time being and yards have accumulated a heavy stock. Buying is from hand to mouth as in the pig iron trade.

We quote per gross ton f.o.b. Birmingham district yards as follows:

Old steel rails	$18.00 to $20.00
No. 1 steel	16.00 to 18.00
No. 1 cast	23.00 to 24.00
Car wheels	23.00 to 24.00
Tramcar wheels	22.00 to 23.00
Stove plate	17.00 to 18.00
Cast iron borings	12.00 to 13.00
Machine shop turnings	12.00 to 13.00

Boston

Pennsylvania and Buffalo Pig Iron Prices Are Still Unsettled

BOSTON, June 19.—Since the lifting of the embargo by the New York, New Haven & Hartford Railroad, foundries, more particularly those in Connecticut, have received heavy shipments of pig iron. In some instances, because of a shortage of common labor, melters have had to pay demurrage and furnaces have been requested to defer additional shipments. Added to this situation is a contraction in foundry activities, partly seasonable and partly because of a slowing up in general business. Recent lowering of prices by furnaces therefore has not attracted new pig iron buying, inquiries involving only a few hundred tons for third quarter shipment and 200 tons No. 2X for fourth. In an effort to stimulate buying, brokers are asking for firm offers, but meeting with little response. Buffalo silicon 2.25 to 2.75 sold at $29, furnace, the past week, or $28.50 base. Report has it $28 base can be done on sizable tonnages, but the market has not been tested. Dollar differentials on Pennsylvania have been halved and melters maintain $28.50 base has been done on a small tonnage. Nothing new has developed in Virginia prices. A small tonnage of standard Richmond charcoal iron sold at $50 furnace base and off-sulphur at $40.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$33.65
East. Penn., sil. 1.75 to 2.25	$32.65 to 33.15
Buffalo, sil. 2.25 to 2.75	33.91 to 34.41
Buffalo, sil. 1.75 to 2.25	33.41 to 33.91
Virginia, sil. 2.25 to 2.75	33.92 to 34.92
Virginia, sil. 1.75 to 2.25	33.42 to 34.42
Alabama, sil. 2.25 to 2.75	35.10 to 37.10
Alabama, sil. 1.75 to 2.25	34.60 to 36.60

Ferroalloys.—The market for ferroalloys is more active, but buying, as usual, is in small lots. Domestic ferromanganese, 78 to 80 per cent, sold the past week at 7¼c. per lb., f.o.b. Pennsylvania shipping point. An unusual sale in this territory involved a small tonnage of ferrosilicon, 97 per cent silicon and 1 per cent iron, at 21c. on cars Boston.

Fluxes.—Sales of fluorspar, 85 per cent, at $31.70 delivered New England, are reported. Limestone is being used extensively in Boston in construction of large buildings. This has to be chipped more or less during construction. Building contractors are selling such chips to foundries for fluxing purposes at prices that eliminate regular brokers. The General Electric Co., West Lynn, Mass., and the Walworth Mfg. Co., Boston, are using such material. The tonnage and money involved are not large, yet such transactions throw some light on methods adopted by contractors to lighten construction costs.

Coke.—A slight improvement in the movement of New England made coke to foundries is reported, yet producers continue to urge shipping instructions against contracts. Producers in this territory have not reduced operations since the inactive spell, but have at times lengthened coking time. Both the New England Coal & Coke Co. and the Providence Gas Co. quoted foundry coke at $14 delivered within the $3.10 freight rate zone. Connellsville fuel can be had for less money, but melters show little interest except for core oven requirements. Small tonnages of Connellsville shipped into this territory the past week or ten days were rejected, but subsequently retained on price adjustment.

Old Material.—Brokers are more concerned with rejections and cancellations than anything else. Most owners of old material will not sell unless obliged to move stock. The General Electric Co., West Lynn, Mass., yesterday received bids on about 40 cars or 1000 tons of turnings, borings, punchings and miscellaneous material. Brokers are bidding $14 on cars for heavy melting steel and sellers asking $15, with actual sales mostly at $14.50. As high as $12.50 on cars was paid the past week for clean machine shop turnings, but others sold at $12 and others for still less. Small tonnages of chemical borings sold at $14.50, while the best price reported paid for rolling mill borings is $12.25 on cars, off $1.75 the past week. A sale of 200 tons No. 1 at $23.50 delivered New England, or $1 under the previous low price, is the outstanding feature of the machinery cast market.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$23.50 to $24.50
No. 2 machinery cast	21.50 to 22.50
Stove plate	13.00 to 14.00
Railroad malleable	26.00 to 26.50
Street car wheels	23.00 to 24.00

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$14.00 to $15.00
No. 1 railroad wrought	17.00 to 17.50
No. 1 yard wrought	15.50 to 16.00
Wrought pipe (1 in. in diam., over 2 ft. long)	12.00 to 12.50
Machine shop turnings	11.50 to 12.00
Cast iron borings, rolling mill	11.25 to 12.25
Cast iron borings, chemical	14.00 to 14.50
Blast furnace borings and turnings	11.25 to 11.75
Forged scrap and bundled skeleton	12.00 to 12.50
Shafting	19.00 to 20.00
Street car axles	19.00 to 20.00
Rails for rerolling	16.00 to 17.00

St. Louis

Southern Iron Offered at $25.50, Birmingham —More Interest Shown

ST. LOUIS, June 19.—Melters in St. Louis and in Indiana and Illinois points in this district are just beginning to show a little interest in their requirements for the last half of the year. So far it has not taken any tangible form, but they are more willing to talk the situation over with the makers of pig iron, and it is expected that some business will be placed soon. In the meantime, sales continue light, the St. Louis Coke & Iron Co., formerly St. Louis Coke & Chemical Co., selling between 1200 and 1500 tons. Some sales were made to melters who have had difficulty in getting shipments through. An Illinois melter is inquiring for prices on two lots, 650 and 350 tons, and a Missouri melter wants 200 tons. A Southern maker with an output of 200 tons daily flooded this territory with telegrams offering iron at $25.50, Birmingham, and quotations at Chicago have declined $1.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$33.16
Northern malleable, sil. 1.75 to 2.25	33.16
Basic	33.16
Southern fdy., sil. 1.75 to 2.25	$30.17 to 32.17

Finished Iron and Steel.—Railroads centering here have begun to send out inquiries for contracts for last

half requirements. The Missouri, Kansas-Texas Railroad wants 1200 to 1500 kegs of wire nails and 250 wheels and the St. Louis Southwestern 250 to 500 wheels. A Dallas (Tex.) electric line wants two carloads of wheels. Some interest also is being shown in steel boiler and superheating tubes. Jobbers are not buying anything at present. A department store to cost $3,000,000 is being planned by B. Nugent & Brothers Dry Goods Co.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.45c.; No. 28 black sheets, cold rolled, one pass, 5.20c.; cold drawn rounds, shafting and screw stock, 4.45c.; structural rivets, 4.15c.; boiler rivets, 4.25c.; tank rivets, ⅞ in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, square or hexagon blank, $2.50; and tapped, $2.50 off list.

Coke.—Coke is only in fair demand. Domestic grades are beginning to show more activity. Foundries are buying in fair quantities. There is an inquiry before the market for 2000 tons of metallurgical coke for July shipment for a Western gas maker.

Old Material.—The market for old material is stagnant. The only transactions taking place now are between dealers to cover orders, and these are rather few. Consumers of specialties are the only ones who are showing any interest, and it is not expected that there will be buying by others for the next 60 days at least. At present prices dealers are not inclined to buy material to lay down. Further declines were recorded. Railroad offerings continue heavy. New lists include: Illinois Central, 15,000 tons; Northern Pacific, 2500 tons; Atchison, Topeka & Santa Fe, 3300 tons; Rock Island, 4000 tons; St. Louis & San Francisco, 1000 tons.

We quote dealers' prices f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton

Iron rails	$20.00 to $20.50
Rails for rolling	19.25 to 19.75
Steel rails, less than 3 ft.	19.50 to 20.00
Relaying rails, standard section	37.50 to 39.00
Cast iron car wheels	19.50 to 20.00
Heavy melting steel	16.50 to 17.00
Heavy shoveling steel	16.50 to 17.00
Frogs, switches and guards cut apart	18.00 to 18.50

Per Net Ton

Heavy axles and tire turnings	12.75 to 13.25
Steel angle bars	15.25 to 15.75
Iron car axles	25.00 to 25.50
Steel car axles	19.00 to 19.50
Wrought iron bars and transoms	19.50 to 20.00
No. 1 railroad wrought	16.00 to 16.50
No. 2 railroad wrought	15.50 to 16.00
Railroad springs	19.50 to 20.00
Cast iron borings	12.50 to 13.00
No. 1 busheling	15.00 to 15.50
No. 1 railroad cast	18.00 to 18.50
No. 1 machinery cast	19.00 to 19.50
Railroad malleable	18.00 to 18.50
Machine shop turnings	11.50 to 12.00
Champion bundled sheets	10.00 to 10.50

Buffalo

Pig Iron Market Continues Weak, with Few Sales Recorded

BUFFALO, June 19.—The volume of inquiry for pig iron resulting in new business continues about on the same level. Most of the new orders are fill-ins and except for occasional 100-ton lots the usual order is a carload proposition. One furnace which has a comfortable backlog is trying to get $29.50, but the other producers are uniformly asking $29 and encountering competition of $28.50 base at points east of Buffalo. Eastern Pennsylvania furnaces quoting $28.50 have taken several tonnages at that figure. There is no doubt the $28.50 price would be made by three of five producers here on any sizable tonnage. It is firmly established, however, that price reduction has no effect on buyers.

We quote f.o.b. per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.	$30.00 to $30.50
No. 2X foundry, 2.25 to 2.75 sil.	29.50 to 30.00
No. 2 plain, 1.75 to 2.25 sil.	29.00 to 29.50
Basic	28.00 to 29.00
Malleable	28.00 to 29.00
Lake Superior charcoal	36.78

Finished Iron and Steel.—A slight flurry in bar demand and a few isolated cases of price concessions on black sheets are the outstanding features. The improvement in new business in bars is not especially great, but shows a decided improvement over the demand for shapes and plates. Jobbers are buying for actual needs and are taking no chances on loading up in any commodities. The fact that there have been no cancellations to speak of and but few requests for deferred shipment is an encouraging factor. Pipe and wire demand is unabated and alloting of pipe tonnages is the rule. The 2.40c. price on bars is the ruling figure, and no lower than that is found. Bar deliveries range from 30 to 60 days, while galvanized sheets hold firm at $5. One mill quoting in this district has made a price of $3.75 on black, with the others holding firm at $3.85.

We quote warehouse prices, Buffalo, as follows: Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5.10c.; cold rolled round shafting, 4.45c.

Coke.—A number of last half contracts have been closed, prices ranging from $6.50 to $7.50 for best foundry grades. For spot shipment prices run from $5.75 to $6.50.

Old Material.—Consumers' stocks are close to exhaustion, but no new replacement orders have come out and new business is practically nil. Rejections are heavier and many of them are on old orders bought at high prices.

We quote, f.o.b. gross ton Buffalo, as follows:

Heavy melting steel	$20.50 to $21.50
Low phos., 0.04 and under	25.00 to 26.00
No. 1 railroad wrought	19.00 to 20.00
Car wheels	21.00 to 22.00
Machine shop turnings	16.00 to 17.00
Cast iron borings	19.00 to 20.00
No. 1 busheling	18.00 to 19.00
Stove plate	18.00 to 19.00
Grate bars	17.00 to 18.00
Bundled sheet stampings	15.00 to 16.00
No. 1 machinery cast	23.00 to 24.00
Hydraulic compressed	18.50 to 19.50
Railroad malleable	24.00 to 25.00

Philadelphia

June Sales of Steel Larger Than May Rate—Pipe Company Buys Pig Iron

PHILADELPHIA, June 19.—Tabulation of sales records by Eastern steel companies and by Philadelphia district sales offices reveals that the tonnage of steel booked in the first half of this month shows a marked improvement over the May rate. One large independent company through its Philadelphia office sold as much steel in the first half of June as in all of May. An Eastern steel company sold in the first half of this month 70 per cent of the entire tonnage it booked last month. To sellers the improvement in demand indicates that consumers are becoming satisfied that present prices will hold for at least the third quarter. The steel market has been pretty well tested by a few large buyers, such as the Pennsylvania Railroad, which has in the last two weeks bought upward of 10,000 tons of plates, shapes and bars without being able to obtain quotations lower than 2.50c. for plates and shapes and 2.40c. for bars.

In the pig iron and scrap markets, there is virtually no improvement in the demand, a 15,000 to 20,000-ton purchase of foreign and domestic iron by an Eastern cast iron pipe company being the only noteworthy activity. Prices of iron are weak at $29, base, for foundry grades and sellers admit the possibility of further declines.

Pig Iron.—Although eastern Pennsylvania furnaces have not reduced their quotations on standard foundry grades from $29 for No. 2 plain, $30 for No. 2X and $31 for No. 1X, it was possible for an Eastern cast iron pipe company to buy about 7500 tons of iron from

nearby furnaces for third quarter delivery at around $28, delivered. The specifications on this iron were slightly less exacting than on standard foundry iron, permitting the furnaces to ship iron which would not be acceptable on their regular foundry contracts, and this may account to some extent for the reduction in prices. In addition to the purchase of domestic iron, the pipe company also purchased an equal quantity, or perhaps as much as 10,000 tons, of foreign iron. Eastern Pennsylvania furnace operators are again alarmed by the prospect of foreign pig iron coming in here in appreciable quantities. Within the past week, Continental iron was offered at $24.50, c.i.f. Philadelphia, but the offers were withdrawn a few days later with the explanation that all of the iron available at this price had been sold. Since then a similar grade of iron has been offered widely at $26, c.i.f. Philadelphia. With the duty of 75c. per ton and the freight rate, this means a delivered price of approximately $28 to foundries located near Philadelphia. Foundry consumers find that they have not used as much iron in second quarter as they expected to, their reduced melt being due largely to labor shortage, and a good deal of second quarter iron will run over into third quarter. For this reason and because of the uncertainty as to the price situation, there is practically no demand for third quarter contracting, current sales being confined mostly to carloads and 100-ton lots for early shipment. Some central and western Pennsylvania furnaces are reported to be making sales in this section at delivered prices lower than are being quoted by the eastern Pennsylvania group of furnaces. Imports of pig iron last week were 3000 tons from England and 1015 tons from British India.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.64 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$29.76 to $30.64
East. Pa. No. 2X, 2.25 to 2.75 sil.	30.76 to 31.64
East. Pa. No. 1X	31.76 to 32.64
Virginia No. 2 plain, 1.75 to 2.25 sil.	32.17 to 33.17
Virginia No. 2X, 2.25 to 2.75 sil.	33.17 to 34.17
Basic delivered eastern Pa.	28.14
Gray forge	28.00 to 29.00
Malleable	31.14 to 31.64
Standard low phos. (f.o.b. furnace)	30.00 to 35.00
Copper bearing low phos. (f.o.b. furnace)	33.00

Foreign Pig Iron

All prices f.o.b. cars Philadelphia, duty paid.	
Continental foundry, 1.80 to 2.50 sil.	$29.00
Continental foundry, 2.50 to 3.25 sil.	30.00
Low phos. copper free, guar. not over 0.035 per cent phos.	$35.00 to 36.00
Continental, phos. 1.50; sil. 2 to 3	29.50

Ore.—Imports of ore last week included 4000 tons of chrome ore from British Africa, 1950 tons of chrome ore from Greece and 1382 tons of iron ore from Sweden.

Coke.—Some furnace operators are trying to make third quarter contracts at less than $5.50, Connellsville, but with what success has not become known. There are unconfirmed reports of quotations of $5.25. Prompt furnace coke is available at $4.75. Foundry coke for prompt shipment is offered at $5.50 to $5.75, Connellsville.

Ferroalloys.—Small sales of ferromanganese for prompt shipment from Eastern furnaces have been made at $125, furnace. This remains the price for third quarter. British makers can offer no deliveries earlier than the latter part of third quarter. Spiegeleisen is available at $45, furnace. Last week's imports of ferromanganese from England were 444 tons.

Billets.—Open-hearth rerolling billets remain at $45 and forging billets at $52.50 to $55, Pittsburgh.

Plates.—An improvement in the demand for plates has been noted by practically all mills. There has been some contracting for third quarter, the purchases of plates by the Pennsylvania Railroad for June-July-August specification totaling 8000 or 10,000 tons. Other consumers have contracted in small lots, usually not more than 500 tons. Contracts have not been made at above 2.50c., Pittsburgh, nor has this price been shaded, but on small lots for early delivery—two to four weeks—some of the Eastern mills continue to quote 2.60c. for sheared and 2.50c. for universals. The Newport News Shipbuilding & Dry Dock Co. is in the market for 700 or 800 tons of plates, shapes and bars for a new boat contract.

Structural Material.—There are reports of slight shading of the 2.50c. price on structural shapes by an Eastern mill, but the larger mills adhere strictly to 2.50c., Pittsburgh. A slight increase in orders has developed within the past week or 10 days.

Bars.—Reports of quotations of 2.35c., Pittsburgh, on concrete reinforcing bars will not down despite the inability of the mills quoting 2.40c. to confirm these reports. There is a slightly better demand. Bar iron is quiet, with prices unchanged at 2.40c., Pittsburgh, for carload lots and 2.50c. for less than carloads.

Bolts, Nuts and Rivets.—The efforts of bolt and nut manufacturers to maintain second quarter discounts on third quarter contracts have not proved successful and Eastern makers have had to follow Pittsburgh and Cleveland competitors in increasing the discounts. Open prices are now on the basis of 50 and 10 per cent off list for large machine bolts, but an extra 2½ or 5 per cent has frequently been granted on desirable business.

Sheets.—The only marked weakness in sheets is on black, which with some sellers are off $2 a ton, quotations of 3.75c., Pittsburgh, for No. 28 gage having appeared more frequently. Apparently blue annealed and galvanized are holding at 3c. and 5c., Pittsburgh, respectively.

Warehouse Business.—Prices for steel out of stock for local delivery are unchanged as follows:

Soft steel bars and small shapes, 3.55c.; iron bars (except bands), 3.55c.; round edge iron, 3.75c.; round edge steel, iron finished, 1½ x ½ in., 3.75c.; round edge steel planished, 4.55c.; tank steel plates, ¼ in. and heavier, 3.65c.; tank steel plates, ⅜ in., 3.95c.; blue annealed steel sheets, No. 10 gage, 4.25c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.65c.; structural shapes, 3.65c.; diamond pattern plates, ¼-in., 5.40c.; ⅜-in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.75c.; narrower than 1 in., all gages, 5.25c.; steel bands, No. 12 gage to ⅞-in., inclusive, 4.35c.; rails, 3.55c.; tool steel, 8.50c.; Norway iron, 7c.

Old Material.—There is no activity of importance in any grades of scrap. Prices show a little more resistance, there having been few declines in the past week.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$18.00 to $19.00
Scrap rails	18.00 to 19.00
Steel rails for rolling	21.00 to 22.00
No. 1 low phos., heavy 0.04 and under	25.00 to 26.00
Cast iron car wheels	23.00 to 24.00
No. 1 railroad wrought	23.00 to 24.00
No. 1 yard wrought	20.00 to 21.00
No. 1 forge fire	17.00 to 18.00
Bundled sheets (for steel works)	16.50 to 17.00
No. 1 busheling	18.00 to 19.00
Mixed borings and turnings (for blast furnace use)	16.00 to 17.00
Machine shop turnings (for steel works use)	16.50 to 17.00
Machine shop turnings (for rolling mill use)	17.00 to 17.50
Heavy axle turnings (or equivalent)	18.00 to 19.00
Cast borings (for steel works and rolling mills)	17.00 to 17.50
Cast borings (for chemical plants)	20.00 to 21.00
No. 1 cast	22.00 to 23.00
Heavy breakable cast (for steel plants)	18.00 to 19.00
Railroad grate bars	17.50 to 18.50
Stove plate (for steel plant use)	16.50 to 17.00
Railroad malleable	22.00 to 24.00
Wrought iron and soft steel pipes and tubes (new specifications)	15.00 to 16.00
Shafting	24.00 to 26.00
Steel axles	24.00 to 26.00

Cleveland

Nominal Prices on Bolts and Nuts Abandoned —Pig Iron Weak

CLEVELAND, June 19.—Lake vessels have about finished hauling grain from the head of the lakes, and practically the entire vessel capacity is now engaged in the ore trade. The car supply for hauling ore is very good at lower lake ports and the June movement will be heavy. The New York Central Railroad has ordered all of its 70-ton self-cleaning steel hopper cars to be placed in operation for handling ore from Ashtabula to furnaces in the Mahoning and Shenango valleys and to furnaces on the Pittsburgh & Lake Erie Railroad and for hauling coal shipments back to Ashtabula. This order provides 7500 large coal cars for handling ore from Ashtabula to inland furnaces.

Pig Iron.—Buyers continued to mark time. Sales during the week increased somewhat in number, but they were all for small lots. Buyers as a rule are limiting their purchases to iron for early requirements. Most of the sales the past week were either for prompt shipment or for delivery not later than August, few third quarter contracts being placed. With July near at hand, there is no indication of a general buying movement. One producer representing several furnaces has sold 20,000 tons of iron this month, but that included considerable iron specified for on a long time contract. Other sellers report aggregate sales of only a few hundred tons each. One producer reports two new inquiries for 700 tons of iron for the third quarter from consumers who had previously bought a portion of their iron for that delivery. Prices show a weakening tendency in the Valley district, where foundry iron is being offered at $28 to $28.50, although some producers are still holding to $29. There are reports of shading 50c. to $28.50 in Buffalo.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$27.50
Northern No. 2 fdy., sil. 1.75 to 2.25	$29.77 to 30.50
Southern fdy., sil. 1.75 to 2.25	31.00 to 33.00
Malleable	29.77 to 30.50
Ohio silvery, 8 per cent	42.52
Standard low phos., Valley furnace	35.00

Ore Stocks.—Another record in the consumption of Lake Superior ore was made in May, the amount consumed being 6,118,540 gross tons as compared with 5,582,303 tons in April, making two record-breaking months in succession. This compares with 3,293,964 tons consumed in May last year. The total amount at furnaces and Lake Erie docks on June 1 was 18,864,791 tons as compared with 19,682,752 tons on May 1 and with 23,024,774 tons on June 1 last year. Stocks at furnaces June 1 were 14,786,481 tons as compared with 14,825,210 tons on May 1.

Semi-finished Steel.—At least two Youngstown and one Pittsburgh district mills have $42.50 as their sheet bar price for the third quarter and one producer has closed for most of its output for that delivery. New inquiry continues light. Prices on slabs have not yet been named.

Finished Iron and Steel.—The volume of new business is rather light, although there is a fair demand for small lots of steel for early requirements from consumers who are following a hand-to-mouth buying policy. Most consumers are under contract for the third quarter, but specifications on these contracts are coming out rather slowly. The market has settled down pretty closely to the Steel Corporation's prices and the spread between these prices and those quoted by mills that are still getting premiums for early shipments has become narrower. One local mill is now quoting tank plates at 2.50c. and another at 2.60c. Eastern plate mills are still quoting 2.50c. to 2.65c. at mill. Small lot sales of structural material are being made by Eastern mills at 2.60c. Reports from the automobile industry in Detroit indicate that production will not be greatly curtailed in July, although some builders of the higher priced cars have slowed down somewhat and others have reduced their specifications in order to carry a smaller stock of frames and other parts. With improved inquiry conditions in the building field are brighter and fabricators are getting somewhat better prices for small work than have been prevailing recently. The contract for the Cleveland Public Library, requiring 2200 tons, has been placed with the Bethlehem Steel Co. Bids have been taken for extensions to a steel plant in Japan requiring 5000 tons, for which bids will also be received from Japanese fabricators. There is good demand for steel from railroads for repair work. The Wheeling & Lake Erie Railroad has placed 95,000 tie plates with a southern Ohio mill.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 9 galvanized wire, 3.70c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 4.65c.; No. 28 galvanized sheets, 5.80c.; No. 10 blue annealed sheets, 3.75c. to 4.06c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.60c.

Reinforcing Bars.—Considerable weakness has developed in rail steel reinforcing bars, which is partly attributed to the activity of an Ohio mill that recently resumed operations. The commonly quoted price is now 2.35c., a decline of $1 a ton, but a local order is reported placed at close to 2.35c., delivered. Orders include one for 350 tons for the Terre Haute, Ind., stadium, which was placed at about 2.30c.

Warehouse Business.—Weakness has developed in warehouse prices on sheets. A leading jobber has reduced galvanized sheets $2 and black and blue sheets $3 a ton, but these reductions do not represent the minimum of the market and quotations as low as 5.40c. are reported on galvanized sheets.

Bolts, Nuts and Rivets.—Some of the local bolt and nut manufacturers have opened their books for third quarter contracts at the prices at which they took second quarter contracts, or 50 and 10 per cent off list for large machine bolts, announcing that they will not attempt to place in effect the nominal quotations that have prevailed for some time on all items except semi-finished hexagon nuts and stove and tire bolts, on which recent sales have been based on quoted prices. Little business has as yet been booked for the third quarter. A leading local rivet manufacturer has opened its book for the third quarter at the current prices at 3.25c. for structural and 3.35c. for boiler rivets, and 65 per cent off list for small rivets. With steel bars at 2.40c., rivet manufacturers are paying $3 more per ton for their steel for the third quarter than they did for the second quarter. Rivet specifications are heavy.

Old Material.—After holding fairly steady for two weeks prices have again declined 50c. a ton on heavy melting steel, $1 on borings and turnings, and to greater amounts on some other grades. Cast scrap has declined $1.50 per ton. Although dealers have been looking for a buying movement, this has as yet failed to develop. Scrap is being offered in good volume, and is mostly being taken by dealers. Small lots of heavy melting steel have been purchased by dealers at $18 and dealers are asking $21 for this grade from mills. Dealers now have few unfilled orders. While cancellations are reported by two mills, it is claimed that there have been fewer than is usual during a declining market. The Big Four Railroad has issued a mid-month list of 1200 tons of various grades of scrap. All quotations below are dealers' prices.

We quote per gross ton f.o.b. Cleveland as follows:

Heavy melting steel	$18.00 to $18.50
Rails for rolling	21.00 to 22.00
Rails under 3 ft.	20.00 to 20.50
Low phosphorus melting	20.75 to 21.25
Cast borings	16.00 to 16.50
Machine shop turnings	15.75 to 16.00
Mixed borings and short turnings	15.75 to 16.00
Compressed sheet steel	16.75 to 17.00
Railroad wrought	16.00 to 16.25
Railroad malleable	25.00 to 25.50
Light bundle sheet stampings	12.75 to 13.00
Steel axle turnings	17.50 to 17.75
No. 1 Cast	22.00 to 23.00
No. 1 Busheling	15.00 to 15.50
Drop forge flashings	15.00 to 15.25
Railroad grate bars	16.00 to 16.50
Stove plate	16.00 to 16.50
Pipes and flues	12.50 to 12.75

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.....2.50c.

Structural Material

Beams, channels, etc., base, per lb.....2.50c.
Sheet piling .....2.65c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.40c.
Soft steel bars for cold finishing.....$3 per ton over base
Reinforcing steel bars, base.....2.40c.
Refined iron bars, base, per lb.....3.25c.
Double refined iron bars, base, per lb.....4.85c. to 5.00c.
Stay bolt iron bars, base, per lb.....8.00c. to 8.50c.

Hot-Rolled Flats

Hoops, ordinary gages and widths, base, per lb.....3.30c.
Hoops, light gage, under 1 in. wide.....3.50c.
Bands, base, per lb.....3.25c. to 3.30c.
Strips, base, per lb.....3.30c.
Cotton ties, per bundle of 45 lb.....$1.60

Cold-Finished Steels

Bars and shafting, base, per lb.....3.25c.
Strips, base, per lb.....5.25c.

Wire Products

Nails, base, per keg.....$3.00
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in.....2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb.....2.75
Annealed fence wire, base, per 100 lb.....2.90
Spring wire, base, per 100 lb.....3.70
Galvanized wire, No. 9, base, per 100 lb.....3.35
Galvanized barbed, base, per 100 lb.....3.80
Galvanized staples, base, per keg.....3.80
Painted barbed wire, base, per 100 lb.....3.45
Polished staples, base, per keg.....3.45
Cement coated nails, base, per count keg.....2.70
Woven fence, carloads (to jobbers).....67½ per cent off list
Woven fence, carloads (to retailers).....65 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads.....60 per cent off list
Machine bolts, small, cut threads....50 and 10 per cent off list
Machine bolts, larger and longer....50 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.50 and 10 per cent off list
Cut threads .....50 per cent off list
Larger and longer.....50 per cent off list
Lag bolts .....60 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads....50 and 5 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in..45 per cent off list
Larger and longer sizes.....45 per cent off list
Hot pressed square or hex. nuts, blank.....$3.50 off list
Hot pressed nuts, tapped.....3.25 off list
C.p.c. and t. square or hex. nuts, blank.....3.50 off list
C.p.c. and t. square or hex. nuts, tapped.....3.25 off list
Semi-finished hex. nuts:
⅞ in. and smaller, U. S. S.....75 and 5 per cent off list
⅞ in. and larger, U. S. S.....70 and 2½ per cent off list
Small sizes, S. A. E.....75, 10 and 5 per cent off list
S. A. E., ⅝ in. and larger....75, 10 and 2½ per cent off list
Stove bolts in packages.....75, 10 and 5 per cent off list
Stove bolts in bulk.....75, 10, 5 and 2½ per cent off list
Tire bolts .....50, 10 and 10 per cent off list

Cap and Set Screws

Milled square and hex. head cap screws,
70 and 10 per cent off list
Milled set screws.....70 and 10 per cent off list
Upset cap screws.....75 per cent off list
Upset set screws.....75 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$3.25
Large boiler rivets, base, per 100 lb.....3.35
Small rivets .....60 and 10 to 60 and 5 off list

Track Equipment

Spikes, ⅝ in. and larger, base, per 100 lb..... $3.15
Spikes, ½-in., ⅝ in. and ¾ in., per 100 lb..... 3.75
Spikes, ⅜ in. 3.75
Spikes, boat and barge, base, per 100 lb.....$3.50 to 3.75
Track bolts, ¾ in. and larger, base, per 100 lb.. 4.00 to 4.25
Track bolts, ½ in. and ⅝ in., base, per 100 lb.. 5.00 to 5.50
Tie plates, per 100 lb..... 2.60 to 2.75
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛	45	19½	¼ to ⅜.....	+11	+39
¼ to ⅜.....	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½.....	30	13
1 to 3.....	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6.....	59	47½	2½	26	11
7 and 8.....	56	43½	3 to 6.....	28	13
9 and 10.....	54	41½	7 to 12.....	26	11
11 and 12....	53	40½			

Butt Weld, extra strong, plain ends

⅛	41	24½	2 to 3.....	61	50½
¼ to ⅜.....	47	30½	¼ to ⅜.....+19		+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½.....	60	49½	1 to 1½.....	30	14

Lap Weld, extra strong, plain ends

2	53	42½	2	23	9
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 to 8	52	39½	7 to 8.....	21	7
9 and 10.....	45	32½	9 to 12.....	16	2
11 and 12....	44	31½			

To the large jobbing trade the above discounts are increased by one point, with supplementary discount of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent, on galvanized.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.....	27	1½ in. .....+18	
2½ to 2¾ in.....	37	1¾ to 1⅞ in.....+ 8	
3 in.	40	2 to 2¼ in.....— 2	
3¼ to 3¾ in.....	42½	2½ to 3 in.....— 7	
4 to 13 in.	46	3¼ to 4½ in.....— 9	

Less carload lots 4 points less.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	55	3 and 3¼ in.	36
1¼ and 1½ in.	47	3½ and 3¾ in.....	37
1¾ in.	31	4 in.	41
2 and 2¼ in.....	22	4½ in. and 5 in.	33
2½ and 2¾ in.....	32		
Hot Rolled			
3 and 3¼ in.....	38	4 in.	43
3½ in. and 3¾ in....	39		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....83 per cent off list
Carbon 0.30 to 0.40, base.....81 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

Cents per Ft.		Cents per Ft.	
2-in. O.D. 12 gage.....	15	2¼-in. O.D. 10 gage...	20
2-in. O.D. 11 gage.....	16	3-in. O.D. 7 gage.....	35
2-in. O.D. 10 gage.....	17	1½-in. O.D. 9 gage....	15
2¼-in. O.D. 12 gage...	17	5⅜-in. O.D. 9 gage....	55
2¼-in. O.D. 11 gage...	18	5½-in. O.D. 9 gage....	57

Tin Plate

Standard cokes, per base box.....$5.50 to $5.75

Terne Plate

(Per package, 20 x 28 in.)

8-lb. coating, 100 lb. base $11.00		20-lb. coating I. C....$14.90	
8-lb. coating I. C....	11.30	25-lb. coating I. C....	16.20
12-lb. coating I. C....	12.70	30-lb. coating I. C....	17.35
15-lb. coating I. C....	13.95	35-lb. coating I. C....	18.35
		40-lb. coating I. C....	19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....3.00c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.85c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb.....5.35c.

Galvanized

No. 28 (base), per lb.....5.00c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.85c.

Manufacturers have pamphlets, which can be had upon application, giving price differentials for gage and extras for length, width, shearing, etc.

Freight Rates

All freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic.	$0.32	Buffalo	$0.265	St. Louis	$0.43	Pacific Coast	$1.34
Philadelphia, export...	0.235	Cleveland	0.215	Kansas City	0.735	Pac. Coast, ship plates	1.20
Baltimore, domestic...	0.31	Cleveland, Youngstown		Kansas City (pipe)...	0.705	Birmingham	0.69
Baltimore, export.....	0.225	Comb.	0.19	St. Paul	0.60	Memphis	0.385
New York, domestic...	0.34	Detroit	0.29	Omaha	0.735	Jacksonville, all rail..	0.50
New York, export.....	0.255	Cincinnati	0.29	Omaha (pipe)	0.705	Jacksonville, rail and	
Boston, domestic.....	0.365	Indianapolis	0.31	Denver	1.27	water	0.415
Boston, export.....	0.255	Chicago	0.34	Denver (pipe)	1.215	New Orleans	0.515

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 30c. to 40c.; ship plates, 30c. to 40c.; ingot and muck bars, structural steel, common wire products including cut or wire nails, spikes, and wire hoops, 30c. to 40c.; sheets and tin plates, 30c. to 40c.; rods, wire rope cable and strands, 75c.; wire fencing, netting and stretcher, 49c.; pipes not over 8 in. in diameter, 50c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Old range non-Bessemer, 51½ per cent iron	5.70
Messabi Bessemer, 55 per cent iron	6.20
Messabi non-Bessemer, 51½ per cent iron	5.55

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	11½c.
Iron ore, Swedish, average 66 per cent iron	11c. to 11.25c.
Manganese ore, washed, 51 per cent manganese, from the Caucasus, nominal	48c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	42c.
Manganese ore, Brazilian or Indian, nominal	45c.
Tungsten ore, per unit, in 60 per cent concentrates	$8.50
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	$18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$125.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid	125.00
Spiegeleisen, domestic, 19 to 21 per cent, per ton, furnace	45.00 to 47.50
Spiegeleisen, domestic, 16 to 19 per cent, furnace, per ton	44.00 to 46.50
Ferrosilicon, 50 per cent, delivered, per gross ton	90.00 to 92.50
Ferrosilicon, Bessemer, 10 per cent, per ton, furnace	48.50
Ferrosilicon, Bessemer, 11 per cent, per ton, furnace	51.80
Ferrosilicon, Bessemer, 12 per cent, per ton, furnace	55.10
Ferrosilicon, Bessemer, 13 per cent, per ton, furnace	59.10
Ferrosilicon, Bessemer, 14 per cent, per ton, furnace	64.10
Silvery iron, 6 per cent, per ton, furnace	37.00
Silvery iron, 7 per cent, per ton, furnace	38.00
Silvery iron, 8 per cent, per ton, furnace	39.50
Silvery iron, 9 per cent, per ton, furnace	41.50
Silvery iron, 10 per cent, per ton, furnace	43.50
Silvery iron, 11 per cent, per ton, furnace	46.80
Silvery iron, 12 per cent, per ton, furnace	50.10
Ferrotungsten, per lb. contained metal	88c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	12c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	11.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	$22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	23.50

Per 1000 f.o.b. works:

	High Duty	Moderate Duty
Fire Clay:		
Pennsylvania	$48.00 to $51.00	$43.00 to $46.00
Ohio	45.00 to 47.00	40.00 to 43.00
Kentucky	45.00 to 47.00	42.00 to 45.00
Illinois	48.00 to 50.00	45.00 to 47.00
Missouri	48.00 to 50.00	38.00 to 43.00
Ground fire clay, per net ton		6.50 to 9.50
Silica Brick:		
Pennsylvania		47.00
Chicago		52.00
Birmingham		48.00
Ground silica clay, per net ton		10.00
Magnesite Brick:		
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)		65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)		40.00
Chrome Brick:		
Standard size, per net ton		50.00

Semi-Finished Steel, f.o.b. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$42.50 to $43.00
Rolling billets, 2-in. and under	42.50 to 45.00
Forging billets, ordinary carbons	47.50 to 50.00
Sheet bars, Bessemer	42.50 to 45.00
Sheet bars, open-hearth	42.50 to 45.00
Slabs	42.50 to 43.00
Wire rods, common soft, base, No. 5 to ¼-in.	51.00
Wire rods, common soft, coarser than ¼-in.	$2.50 over base
Wire rods, screw stock	$5 per ton over base
Wire rods, carbon 0.20 to 0.40	$3 per ton over base
Wire rods, carbon 0.41 to 0.55	$5 per ton over base
Wire rods, carbon 0.56 to 0.75	$7.50 per ton over base
Wire rods, carbon over 0.75	$10 per ton over base
Wire rods, acid	$15 per ton over base
Skelp, grooved, per lb.	2.45
Skelp, sheared, per lb.	2.45
Skelp, universal, per lb.	2.45

Finished Iron and Steel, f.o.b. Mill

Rails, heavy, per gross ton	$43.00
Rails, light, new steel, base, per lb.	2.25c.
Rails, light, rerolled, base, per lb.	2.15c. to 2.20c.
Spikes, $\frac{5}{16}$-in. and larger, base, per 100 lb.	$3.15 to $3.25
Spikes, ½-in., $\frac{7}{16}$-in. and $\frac{3}{8}$-in., base, per 100 lb.	3.25 to 3.75
Spikes, $\frac{5}{16}$-in., base, per 100 lb.	3.25 to 3.75
Spikes, boat and barge, base, per 100 lb.	3.50 to 3.75
Track bolts, $\frac{5}{8}$-in. and smaller, base, per 100 lb.	4.25 to 5.50
Track bolts, ¾-in. and larger, base, per 100 lb.	4.00 to 4.50
Tie plates, per 100 lb.	2.55 to 2.60
Angle bars, per 100 lb.	2.75
Bars, common iron, base, per lb.	2.50c. to 2.60c.
Bars, rails, steel reinforcing, base, per lb.	2.15c. to 2.25c.
Ground shafting, base, per lb.	3.65c.
Cut nails, base, per keg	$3.40

Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100 (1½% Nickel, 10 to 20 per cent Carbon)	$3.50 to $3.75
2300 (3½% Nickel)	5.50 to 5.75
2500 (5% Nickel)	8.00 to 8.25
3100 (Nickel Chromium)	4.50 to 4.75
3200 (Nickel Chromium)	6.25 to 6.50
3300 (Nickel Chromium)	8.25 to 8.50
3400 (Nickel Chromium)	7.25 to 7.50
5100 (Chromium Steel)	4.00 to 4.25
5200 (Chromium Steel)	8.25 to 8.50
6100 (Chromium Vanadium bars)	5.25 to 5.50
6100 (Chromium Vanadium spring steel)	5.00 to 5.25
9250 (Silico Manganese spring steel)	4.00 to 4.25
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	5.50 to 5.75
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.75 to 5.00
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	4.50 to 4.75
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.50 to 4.75

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb. f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets down to and including 2½-in. sq. there is a size extra of $10 per gross ton; on billets smaller than 2½-in. sq. the net ton bar price applies.

Truscon Steel Co. Offers Common Stock

Fifty thousand shares of the recent 100,000 common shares issued by the Truscon Steel Co., Youngstown, are being offered at $20 a share. President Julius Kahn said that "average net earnings available for the common stock since 1913 have been 34.46 per cent a year." Cash dividends have been paid on the common stock without interruption, with the exception of 1907, since the organization of the company in 1903.

"The outlook is exceptionally good, business for May having been the largest in the history of the company," according to President Kahn. The balance sheet after the new financing shows current assets of $5,548,318 and current liabilities of $1,110,004. There is no funded debt. After charging out reserves and liabilities there remain net assets of $8,011,087, equivalent to about $350 a share on preferred stock of $100 par value and to $14 a share on the common stock.

The Union Gas & Electric Co., Cincinnati, is preparing plans for a new electric power plant to cost approximately $12,000,000. No definite decision has yet been made as to whether the plant will be erected in West Virginia or in Cincinnati.

FABRICATED STEEL BUSINESS

May Contracting Only 58 Per Cent of Capacity Against 81 Per Cent in April

WASHINGTON, June 19.—May sales of fabricated structural steel, based on figures received by the Bureau of the Census in cooperation with the Structural Steel Society, were much less than in April, according to the Department of Commerce. Total sales of 130,929 tons were reported for May by firms with a capacity of 225,790 tons per month.

Tonnage booked each month by 175 identical firms, with a capacity of 229,575 tons per month, is shown below, together with the per cent of shop capacity represented by these bookings. For comparative purposes the figures are also prorated to obtain an estimated total for the United States on a capacity of 250,000 tons per month.

1922	Actual Tonnage Booked	Per Cent of Capacity	Estimated Total Bookings
April	200,588	87	217,500
May	184,638	81	202,500
June	168,498	73	182,500
July	157,631	69	172,500
August	156,011	68	170,000
September	146,146	64	160,000
October	132,450	58	145,000
November	111,794	49	122,500
December	138,024	60	150,000
1923			
January	172,415	75	187,500
February	183,938	80	200,000
March	218,997	95	237,500
April	184,884*	81	202,500
May	130,929**	58	145,000

*Reported by 166 firms with a capacity of 228,455 tons.
**Reported by 157 firms with a capacity of 225,790 tons.

Week's Awards Small and New Inquiries Falling Off

The chief items of the week include:

Cleveland Public Library, 2200 tons, to Bethlehem Steel Bridge Co.; announcement of letting of general contract published in June 7 issue.

Brooklyn Edison Co., supports for boilers, 200 tons, to National Bridge Works.

Garage on Montague Street, Brooklyn, 300 tons, to Taylor-Fichter Steel Construction Co.

Loft building on West Thirty-sixth Street, New York, 1100 tons, to Hinkle Iron Co.

Borden's Farm Products Co., milk station in Brooklyn, 500 tons to George A. Just Co.

Staten Island subway shafts, 1500 tons, to Bethlehem Shipbuilding Corporation; general contractor, Pat McGovern.

Boston & Maine, bridges, 150 tons, to Boston Bridge Works.

New York Central, three bridges, 250 tons total, to Bethlehem Steel Bridge Co.

Finnish Club building, Forty-second Street, New York, 200 tons, to National Bridge Works.

Fordham University gymnasium, 300 tons, to National Bridge Works.

Phillips Petroleum Co., 26 oil storage tanks, 4300 tons, to a Southwestern fabricator.

San Francisco Hotel Co., five-story addition, San Francisco, 752 tons, to Dyer Brothers.

E. L. Wilson Hardware Co., Beamont, Tex., upset anchor rods and washers, 247 tons, to Houston Construction Co.

Chicago, Milwaukee & St. Paul, viaduct, Donovan, Ill., 188 tons, to American Bridge Co.

Western Pacific, shop building, Sacramento, Cal., 187 tons, to Union Construction Co.

Illinois Central, University Avenue and Chester Street subways, Champaign, Ill., 205 tons to McClintic-Marshall Co.

Church, Pulaski, Wis., 210 tons, to Vulcan Iron Works.

Bucyrus Co., South Milwaukee, Wis., erecting shop, 175 tons, to Worden-Allen Co.

Allen & Co., Kenosha, Wis., textile mill addition, 100 tons, to Lakeside Bridge & Steel Co.

Frank Smith Paper Co., Middletown, Ohio, paper mill building, 550 tons, to Massillon Bridge Co.

Champion Coated Paper Co., Hamilton, Ohio, mill building, 600 tons, to General Iron Works Co.

Louisville & Nashville Railroad, pass-over at Louisville, Ky., 150 tons, to Mt. Vernon Bridge Co.

State of West Virginia, bridge work, 600 tons, divided among six fabricators.

United States Government, 2 dredge boats, 300 tons, to Jacksonville fabricator.

Vacuum Oil Co., gas holder at Paulsboro, N. J., 400 tons, to Stacey Mfg. Co.

Niagara Falls Trust Co., Niagara Falls, N. Y., bank building, 250 tons, to Jones & Laughlin Steel Corporation.

Holmes Savings Bank, Toledo, Ohio, bank building, 600 tons, to American Bridge Co.

Crawford Building, Cleveland, 200 tons, to Forest City Steel & Iron Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

First National Bank, Huntington, W. Va., 500 tons; indefinitely postpoined.

Roosevelt Street pier, New York, 200 tons; indefinitely postponed.

Elks' Memorial Building, Chicago, 500 tons.

Masonic Temple, South Bend, Ind., 500 tons.

Missouri Pacific, 10 girder spans, 400 tons.

City of St. Paul, Minn., bridge repair work, 300 tons.

Schuster Department Store, Milwaukee, addition, 350 tons.

Private warehouse, Indianapolis, 300 tons.

Pennsylvania Southwestern Region, three 75-ft. girder spans, 150 tons.

Folsom Street viaduct enlargement at Milwaukee, 500 tons. Contract for superstructure let to Newton Engineering Co., Milwaukee, which is taking bids on structural steel.

Grand River bridge, Grand Haven, Mich., 630 tons, Milwaukee Bridge Co. low bidder. All bids rejected and new bids to be asked on revised specifications.

Straus Building, Grand Avenue and Third Street, Milwaukee. Bids on 250 tons being taken by Gustave E. Kahn, general contractor, 114 Grand Avenue, Milwaukee.

United States Engineers' Office, Louisville, Ky., six steel dump scows, approximately 600 tons, bids open July 16.

United States Engineers' Office, Cincinnati, two oil barges, 200 tons, bids being taken.

Projected viaduct work in Alabama, 600 tons, bids asked by Birmingham jobber.

Shibaura Engineering Works, Yokohama, Japan, machine shop, foundry and forge shop, 5000 tons; H. K. Ferguson Co., Cleveland, general contractor.

Rock Island Railroad bridges, 2600 tons, to be readvertised.

RAILROAD EQUIPMENT BUYING

Both Orders and Inquiries for Cars and Locomotives Are Light

Orders for freight cars during the past week totaled only 2530, of which 2500 were for a Canadian road. Inquiries are also light, those reported covering only 280 cars.

The Nashville, Chattanooga & St. Louis Railroad is in the market for 75 hopper cars and 175 gondolas.

The New York, New Haven & Hartford is asking for prices for repairing 500 to 1000 steel underframe box cars.

The Union Railroad is in the market for 50 bodies for 70-ton flat cars.

The Canadian National Railways have placed orders with Hamilton, Ont., Montreal, Que., and New Glasgow, N. S., manufacturers for 2500 40-ton box cars.

The Missouri Pacific has let repairs on 35 locomotives to the Pittsburgh Boiler & Machine Co.

The New York Central is inquiring for repairs on 2000 cars, involving 6000 tons of steel.

The Detroit United Lines are inquiring for 30 flat cars.

The Wabash is in the market for 1 private car.

The Chino Copper Co. placed 20 dump cars with the National Steel Car Corporation.

The Utah Copper Co. ordered 6 cabooses and 4 work cars from the Magor Car Co.

The H. K. Ferguson Co., Cleveland, has taken a contract for a machine shop, foundry and forge shop for the Tsurumi steel plant of the Shibaura Engineering Works, Yokohama, Japan. Prices for these buildings which will require 5000 tons of steel have been taken from American fabricators and a representative of the Ferguson company is on his way to Japan where prices for steel for these buildings will also be secured from Japanese fabricators.

C. F. Blue, Jr., George O. Loeffler, R. C. Purkhiser have organized The Mill & Foundry Supply Co., 1214 Bessemer Building, Pittsburgh, and will represent the Climax Molybdenum Co. in the Pittsburgh district.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
June	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
13.....	15.37½	14.87½	41.87½	7.25	6.95	6.47½	6.12½
14.....	15.37½	14.87½	41.30	7.25	6.95	6.42½	6.07½
15.....	15.37½	14.87½	41.00	7.25	6.95	6.35	6.00
16.....	15.37½	14.87½	....	7.25	6.95	6.35	6.00
18.....	15.37½	14.87½	40.62½	7.25	6.95	6.35	6.00
19.....	15.37½	14.87½	40.25	7.25	6.95	6.35	6.00

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, June 19.

The situation in general is very little changed, with some markets steady to firm and others weaker. Copper has advanced slightly and is a little stronger. The tin market has turned quiet with lower prices. The lead market is dull and a little easier and the zinc market has continued to decline.

Copper.—Two incidents last week occurred which tended to make the copper market more optimistic and firmer. One was the announcement that the 400,000,000 lb. of copper in the hands of the Copper Export Association had been delivered and that the surplus in May of copper stocks in general had been reduced further than earlier had been calculated. The latter part of last week witnessed fairly good sales of electrolytic copper both for domestic and foreign account, the latter being better than for some time. By the end of the week the price had advanced so that sales were made at both 15.12½c. and 15.25c., delivered. Yesterday and today, however, due to some weakness in the London market, an easier tone has developed here. As a result inquiries and sales are smaller and less is heard of the 15.25c. price. The minimum quotation for electrolytic copper is 15.12½c., delivered, or ¼c. higher than a week ago with the situation fairly firm. Lake copper is steady at 15.37½c., delivered.

Tin.—The market has been generally dull and stagnant during the week except on Friday when sales of about 300 tons were made, mostly nearby delivery at 41c. with some futures at 40.62½c. to 40.75c. Yesterday there was some inquiry for off-grades of 99 per cent tin for spot and June delivery and a little for spot Straits. Today the market has also been fairly active. The general apathy of consumers is interpreted as indicating that they are amply supplied and are not at all anxious despite the statistical position which indicates a possibility of short supplies for June and July. Prices both here and in London have declined quite sharply with spot Straits quoted today at 40.25c., New York, and with spot standard at London quoted at £187 15s., future standard at £188 12s. 6d. and spot Straits at £190, all about £10 per ton lower than a week ago. Arrivals thus far this month have been 1710 tons, with 6780 tons reported afloat.

Lead.—The market is very quiet and there is very little new demand, but deliveries into consumption continue heavy. Imported lead is still no longer a factor, but may be later. Mexican lead is now going to Europe and if supplies there become larger than consumption imports here may become a factor. It is generally admitted that consumption in this country is falling off as well as new business into which the metal enters as finished products. On the other hand, a reduction in production is possible because of summer weather. The market generally is a waiting one.

Zinc.—Further weakness has developed in prime Western zinc and quotations are lower at 6c., St. Louis, or 6.35c., New York. This situation is due largely to almost an entire absence of inquiries. Sales have been at the lowest volume in weeks. There is, however, no pressure to sell on the part of producers who are fairly independent and it is the opinion that the bottom has been reached and that the 6c. level will not be broken.

Nickel.—Quotations for shot and ingot metal are unchanged at 29c. to 32c. per lb., with electrolytic held at 32c. by the leading producers. In the outside market quotations for shot and ingot nickel are 29c. to 32c. per lb.

Antimony.—The market is very quiet and wholesale lots of Chinese metal for early delivery are quoted at 6.75c. per lb., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent, in wholesale lots is quoted for early delivery by such importers as can deliver the metal at 26.50c. to 27c. per lb., New York, duty paid. The leading domestic producer makes public no quotation.

Chicago

June 19.—The copper market is firmer because of foreign buying; domestic consumers are still showing little interest in the metal, but it is perhaps significant that holders of speculative lots are no longer pressing their material for sale but are holding for higher prices. The other metals are quiet and weak, tin, lead and zinc having again declined. We quote, in carload lots, lake copper, 16c.; tin, 42.50c.; lead, 7c.; spelter, 6.05c.; antimony, 8.50c. in less than carload lots. On old metals we quote copper wire, crucible shapes and copper clips, 12c.; copper bottoms, 10c.; red brass, 8.50c.; yellow brass, 6.50c.; lead pipe, 5c.; zinc, 4c.; pewter, No. 1, 25c.; tin foil, 26.50c.; block tin, 32.50c.; all buying prices for less than carload lots.

Mining Institute at Duluth

The 23d annual meeting of the Lake Superior Mining Institute will be held on the Minnesota iron ranges Wednesday, Thursday and Friday, Aug. 29, 30 and 31. Headquarters will be at the Spalding Hotel, Duluth. On Wednesday there will be a visit to the Minnesota Steel Co. plant in the afternoon and business session in the evening. A visit will be paid on Thursday to the Mesabi Iron Co. plant at Babbitt, Minn., and mines at Virginia and Hibbing. The business meeting in the evening will be at Hibbing. Friday will be spent visiting the mines in the Cuyuna district, the party returning to Superior and Duluth in time for evening trains east and south.

Mellon Institute of Industrial Research

In the tenth annual report of this branch of the University of Pittsburgh is given an outline of work which has been under way during the year, there being now 50 fellowships in operation employing 80 research chemists and engineers and supported by a total budget of $351,000. The first page bears the following quotation from Robert Kennedy Duncan, under whose direction the institute was founded. "The efficiency—of control, of action and of result—that marks the operations of science is the saving word to all the lives and works of man."

Steel Cable Bridge for Mt. Rainier Park

WASHINGTON, June 19.—Bids will be opened in the office of the superintendent of Mt. Rainier National Park, Longmire, Wash., at 2 p. m., July 2, for furnishing and erecting complete a steel cable suspension highway bridge of 198-ft. span in Mt. Rainier National Park, it was announced today by the Department of the Interior. The main suspension cables are to be 2¾ in. in diameter with 1-in. steel hangers or suspenders and 1-in. galvanized steel wire wound guy cables.

The second meeting of manufacturers and users of refractories which was to have been held in Washington, June 18, with the Division of Simplified Practice, Department of Commerce, was postponed indefinitely. This was due to the fact that some of those who were to attend found it impossible to come to Washington at this time. A preliminary meeting looking to a reduction in the number and types of refractories used by iron and steel manufacturers, foundrymen and others, was held in Washington some time ago.

PERSONAL

The Philadelphia Foundrymen's Association gave a dinner at the Manufacturers' Club, Philadelphia, Wednesday evening, June 13, in honor of Howard Evans, its secretary, as a testimonial to his long and faithful work as an officer of the organization. The event was a complete surprise to Mr. Evans, who had sent out the usual notices for the regular meeting of the association, but a committee had also been at work arranging the affair secretly and when Mr. Evans entered the banquet room at 6 p. m. he found it tastefully decorated. He was escorted to a seat of honor, heartily acclaimed by his friends. The dinner was in charge of Frederick Devlin, president of the association. A watch suitably inscribed was given to Mr. Evans, the presentation remarks being made by William J. Johnson of the Baldwin Locomotive Works. Other speakers were Dr. E. J. Cattell of the Philadelphia Chamber of Commerce; Thomas Armstrong, vice-president of the Manufacturers' Club; J. H. Bougher, president J. W. Paxson Co., Philadelphia; George Pettinos and C. R. Spare of the American Manganese Bronze Mfg. Co., Philadelphia. Mr. Evans organized the Philadelphia Foundrymen's Association in July, 1891, and has served as its secretary ever since. He organized the national association May 12, 1896, and was president from 1896 to 1900. He is vice-president and a director of the J. W. Paxson Co., foundry supplies, Philadelphia.

HOWARD EVANS

R. W. McPhee, who for the past few years has been with Henry Pels & Co., New York, dealers in plate fabricating machinery, has purchased an interest in the Blackman, Hill, McKee Machinery Co., St. Louis, and will begin his new work July 1.

J. Leonard Replogle has been elected a director of the Brightman Mfg. Co., Columbus, Ohio, manufacturer of bolts and nuts.

A. W. MacLaren, formerly general traffic manager of Morris & Co., packer, Chicago, has been appointed vice-president in charge of sales of the Chicago Bearing Metal Co., Chicago.

Walter J. Francis has been elected president of the Engineering Institute of Canada. He was born in Toronto in 1872 and was graduated from the University of Toronto in 1893 with the degree of C.E.

Lewis S. Edgarton, professor in metallurgy at the Mechanics Institute, Rochester, N. Y., and a graduate of Massachusetts Institute of Technology, has become associated with the Ogden R. Adams Co., Inc., Rochester. He will be attached to the Buffalo office. Charles P. Hery, of several years' experience in the sale of metal and wood-working machinery, mill supplies and small tools, has become associated with the company at the home office, and Howard W. Gillette, for several years with the company, has been transferred to take charge of the Syracuse, N. Y., office.

George A. Gaylord, for the past 25 years general manager and for the last two years treasurer of the Vitrofied Wheel Co., Westfield, Mass., has tendered his resignation to take effect not later than Aug. 1.

F. W. Stickle, Capitol Foundry Co., Hartford, Conn., has been reelected president of the Connecticut Foundrymen's Association.

Gilbert Drysdale, formerly with the H. B. Smith Co., North Side Foundry, Westfield, Mass., has been made superintendent of the Plainfield Foundry Co., Plainfield, Conn.

William J. Sloan, for many years identified with Isaac G. Johnson & Co., Spuyten Duyvil, N. Y., has accepted the position of core superintendent for the foundry of the Blake & Knowles plant of the Worthington Pump & Machinery Corporation, East Cambridge, Mass.

F. W. Blackeby, sales manager Isaac G. Johnson & Co., Spuyten Duyvil, N. Y., after 22 years with the company, becomes sales manager of the electric steel department, Eastern Steel Castings Co., Avenue L and Edward Street, Newark, N. J.

Dr. W. R. Whitney, director of the research laboratory of the General Electric Co. has been elected a member of the corporation of Massachusetts Institute of Technology for a term of five years. He was graduated from that institution in 1890 and has for some time been a non-resident professor of theoretical chemistry there. Walter Humphreys, Brookline, and Charles T. Main, a prominent consulting engineer of Boston, were also elected to the corporation, the three succeeding Paul W. Litchfield, Arthur D. Little and Eben S. Stevens.

J. M. Watson, director of the metallurgical department of the Hupp Motor Car Co., was recently elected chairman of the Detroit chapter of the American Society for Steel Treating.

General Otto H. Falk, president Allis-Chalmers Mfg. Co., and vice-president of the Falk Corporation, Milwaukee, returned June 12 from an extensive European tour for business investigation and recreation.

Armin A. Schlesinger, formerly president and still a director of the Steel & Tube Co. of America, arrived in Milwaukee on June 14 from a tour of the continent lasting three months.

Edwin W. Harrison, formerly president of the Superior Steel Corporation, Pittsburgh, who resigned that position and severed his connection with that company, has been elected chairman of the American Tube & Stamping Co., Bridgeport, Conn.

Herman A. Poppenhusen, president Metals Refining Co., Hammond, Ind., has resigned on account of ill health and has been succeeded by William Wilke, Jr.

Paul G. Leoni, managing director of the Iron & Ore Corporation of America, sailed June 15 for Europe. He expects to visit France, Belgium, Germany and Holland on business of the company.

Judge Elbert H. Gary, chairman United States Steel Corporation, was in Northampton, Mass., Tuesday, attending the graduation of a granddaughter at Smith College.

Steel Furniture Shipments

WASHINGTON, June 19.—The Department of Commerce announces May shipments of steel-furniture stock goods, based on reports received by the Bureau of the Census in cooperation with the National Association of Steel Furniture Manufacturers. Shipments by 22 manufacturers amounted to $1,506,072 in May, as against $1,520,286 in April and $1,056,735 in May, 1922. The table gives comparative figures for the first five months of 1923 and 1922:

	1923	1922
January	$1,362,470	$983,834
February	1,307,173	967,125
March	1,709,206	1,087,228
April	1,520,286	1,058,382
May	1,506,072	1,056,735

OBITUARY

William E. Manning

WILLIAM EDWARDS MANNING, 53, vice-president in charge of sales of the Youngstown Sheet & Tube Co., Youngstown, Ohio, died June 15, following an operation. Mr. Manning was stricken while on a business trip last week to New York. He was taken to a hospital immediately upon his return to Youngstown, submitted to an operation for a chronic ailment, and lingered until Friday evening. Mr. Manning had been in the sales department of the Sheet & Tube company since its organization in 1900, except for a period when he served the company as secretary. Mr. Manning began his career in the industry in a clerical capacity with the Brown-Bonnell Co., subsequently absorbed by the Republic Iron & Steel Co. At the time of this absorption he was made head of the order department.

W. E. MANNING

When the Sheet & Tube company was organized, Mr. Manning severed his connection with the Republic company to become assistant manager of sales for the new concern, and had been identified with the company ever since. In 1913, he was elected secretary, serving in this capacity for four years, when he was chosen vice-president. His long experience and wide acquaintance served to make him one of the leading figures among men who direct sales organizations over the country. During all of his connection with the Sheet & Tube company, Mr. Manning was always closely associated with President James A. Campbell in the management of the organization.

Mr. Manning was president of the Continental Supply Co. and the Youngstown Steel Products Co., subsidiary organizations of the company which he served as vice-president. He was a member of the American Iron and Steel Institute, and was a regular attendant at its sessions; he also belonged to the American Institute of Mining and Metallurgical Engineers. Besides his business interests, Mr. Manning was active in many civic projects in his own community.

DR. LOUIS BELL, West Newton, Mass., chief engineer of the electric power transmission department, General Electric Co., Lynn., and for two years editor of the *Electrical World*, died on June 14. Dr. Bell was a native of Chester, N. H., at which place he was born in 1864.

WILLIAM T. ISAAC, for about 25 years vice-president and general manager of the Gurney Heater Mfg. Co., Boston and Framingham, Mass., died on June 10 at his home in West Newton, Mass., in his fifty-second year.

JACOB JOHN HILPERTSHAUSER, president Optenberg Iron Works, Sheboygan, Wis., died June 11. He was 58 years of age and a native of Sheboygan. He formerly was associated with the Myers Machine Co. and later became president of the Globe Foundry & Machine Co.

OTTO F. KAESER, member of the Atlas Engineering Works, Milwaukee, and formerly of the engineering staff of the Bucyrus Co., South Milwaukee, died June 10, aged 47 years.

EDWARD D. REDFIELD, aged 59 years, president Taylor & Fenn Co., Hartford, Conn., and of several other manufacturing companies, died at Hartford Hospital on June 15, after a long illness. Mr. Redfield was a director of the Wheelock Coil Pipe Co., Hartford, and of E. Horton & Son Co., Windsor Locks, and also president of the Sexton Machine Co., Hartford.

HARVEY E. HACKENBERG, secretary Union Carbide & Carbon Corporation, Cleveland, and formerly treasurer of the National Carbon Co., died June 13, aged 58 years.

HENRY N. SPENCER, president Howell Electric Motors Co., Howell, Mich., died at his home in that city on June 4.

CHARLES T. TAYLOR, for many years secretary-treasurer of the William Cramp & Sons Ship & Engine Building Co., Philadelphia, died in that city on June 13, aged 67 years. Mr. Taylor had been with the company since 1892.

ARTHUR T. BEACH, prominent machinery manufacturer, died at his home, 11 Crooke Avenue, Brooklyn, Saturday, June 16, following an illness of two weeks. His illness is believed by his family to have been brought on by grief over the death of his wife, which occurred a month ago. Mr. Beach was 61 years old and for 30 years had been actively at the head of the Beach-Russ Co., manufacturer of vacuum pumps, pressure blowers, rotary compressors, etc. He was also president of the Abbe Engineering Co., New York, manufacturer of pulverizing and mixing machinery, and the Provost Engineering Corporation, Brooklyn, manufacturer of filter presses. Mr. Beach leaves three sons, Charles, Edward and Arthur, Jr., all of whom were associated with him in his business enterprises.

HARLEY B. GIBBS, who was connected with the King Bridge Co., Cleveland, for over 35 years and for some time was a director and secretary-treasurer of that company, died June 16, at Norwalk, Ohio, where he had lived since his retirement a few years ago. He was 74 years of age.

CYRUS A. JEWETT, first vice-president of the George Worthington Co., wholesale hardware dealer, Cleveland, died suddenly from a heart attack June 19, aged 63 years. He had been connected with the company since 1875, starting as an office boy.

Sheet Shipments Increase

The monthly report of the National Sheet and Tin Plate Manufacturers' Association for June shows shipments of 278,059 net tons against 253,563 tons in April. Gross unfilled orders at end of May were 551,139 tons against 577,609 tons a month before.

The Senate of the Wisconsin Legislature has killed the so-called Allen bill, originating in the Assembly, which intended to make an appropriation of $10,000 for the purposes of a State commission to assist agencies engaged in combating the "Pittsburgh Plus" practice. The principal argument against the bill was that Wisconsin has two United States Senators at Washington who are opposed to Pittsburgh basing and there is no occasion to appropriate State funds to employ special legal talent.

Transfer of the properties of the Electric Alloy Steel Co., formerly of Youngstown, and the Atlas Crucible Steel Co., Dunkirk, N. Y., to the Atlas Steel Corporation, with headquarters at Dunkirk, is announced. Stock of the new company is placed under control of a voting trust for a period of five years to "insure stable and economic management."

The new by-product plant of the Weirton Steel Co., Weirton, W. Va., consisting of 37 improved type Koppers ovens has been completed and is now being warmed up preparatory to the starting of operations. It is expected that the plant will be producing coke soon after July 1.

British Iron and Steel Market

Pig Iron Consumers Waiting for Lower Prices—Ruhr Coke No Longer Required Put Into Stock in Lorraine—Finished Steel Quiet

(By Cable)

LONDON, ENGLAND, June 19.

Pig iron is dull, with a lower tendency. Prices of Cleveland iron nominally are unaltered, but makers are willing to accept 1s. (23c.) less on most grades. Consumers are awaiting lower figures, but producers hesitate to announce reductions, owing to the difficult position of raw materials. The easier tendency of coke should assist. Durham coke is now 41½ to 43s. ($9.59 to $9.93).

Some Scotch furnaces have been banked and their resumption is unlikely until after the annual July holidays. Hematite is easy and makers probably would accept 2s. (46c.) reduction for actual business.

Finished iron and steel position is quiet. Buyers continue to hold off except for urgent requirements. Makers in the meantime are disinclined to cut their prices, but the tendency nevertheless is downward. The approaching Scottish holiday stoppage is affecting business adversely.

Pig iron exports in May, excluding ferroalloys, amounted to 81,215 tons. The total iron and steel exports aggregated 424,509 tons.

Continental material is firmer, owing mainly to the revival on the Belgian market, which has affected French quotations sympathetically. British and overseas buyers are not showing much interest as yet.

No longer is the French Government obliging Lorraine iron makers to stock one-third of their Ruhr coke receipts. In the future only the surplus over the monthly quota of 150,000 tons is to be put into stock. This is reckoned as a sign of confidence that France can compel the Ruhr plants to continue to produce. Nevertheless, it is felt that a critical period is approaching and French iron makers admit the possibility of blowing out some furnaces in August.

Tin plate is dull. There is some business passing with the works, at minimum quotations, mostly for July delivery. Some merchant sales have been made at below these figures. The future of the tin plate conference is considered doubtful.

Black sheets are quiet, but steady, with fair inquiry, but little business so far materializing.

Similar conditions obtain in the galvanized sheet market, Indian bids being too low for acceptance.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.62 per £1, as follows:

Durham coke, delivered	£2	3s.			$9.93	
Bilbao Rubio ore†	1	4			5.54	
Cleveland No. 1 foundry	6	7½	to £6	9s.	29.45 to	$29.80
Cleveland No. 3 foundry	5	17½			27.14	
Cleveland No. 4 foundry	5	15			26.57	
Cleveland No. 4 forge	5	12½			25.99	
Cleveland basic	6	0			27.72	
East Coast mixed	5	17½			27.14	
Ferromanganese	18	0			83.16	
Ferromanganese*	20	0			92.40	
Rails, 60 lb. and up	10	0	to 10	10	46.20 to	46.51
Billets	8	15	to 9	15	40.43 to	45.05
Sheet and tin plate bars, Welsh	9	2½			42.16	
Tin plates, base box	1	3⅛	to 1	3¼	5.34 to	5.37
					C. per Lb.	
Ship plates	9	15	to 10	5	2.01 to	2.11
Boiler plates	12	10	to 13	0	2.58 to	2.68
Tees	10	10	to 11	0	2.17 to	2.27
Channels	9	15	to 10	5	2.01 to	2.11
Beams	9	10	to 10	0	1.96 to	2.06
Round bars, ¾ to 3 in.	11	5	to 11	15	2.32 to	2.42
Galvanized sheets, 24 g.	18	10	to 18	15	3.82 to	3.87
Black sheets, 24 gage	13	15	to 14	5	2.84 to	2.94
Black sheets, Japanese, specifications	15	5			3.15	
Steel hoops	11	0	& 13	0*	2.27 &	2.68*
Cold rolled steel strip, 20 g.	17	7½			3.58	
Cotton ties, Indian specifications	15	0			3.09	

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports, Delivery as Specified

Foundry pig iron:						
Belgium, June, July	£5	5s.			$24.26	
France, June, July	5	0			23.10	
Luxemb'g, June, July	5	15	to £6	0s.	26.56 to	$27.72
Billets:						
Belgium, June, July	6	10			30.03	
France	6	10			30.03	
Merchant bars:					C. per Lb.	
Belgium, July	7	5	to 7	7½	1.56 to	1.52
Luxemburg, June	7	2½			1.47	
Joists (beams):						
Belgium, July	7	5			1.50	
Luxemburg	7	7½	to 7	10	1.52 to	1.55
¼-in. plates:						
Belgium, June, July	8	5			1.70	
⅜-in. plates:						
Luxemburg	7	7½			1.52	
Belgium	7	10			1.55	

American Engineering Council at St. Paul

At the meeting of the executive board of the American Engineering Council of the Federated American Engineering Societies held in St. Paul, June 8 and 9, the committee on transportation, which is considering ways and means whereby the federated societies may aid in solving the transportation problem of the nation, was authorized to continue its studies.

The committee on storage of coal reported that the survey was well under way. Sub-committees are being formed in 80 centers and each member society has been requested to designate a member on each sub-committee. Dean Perley F. Walker, University of Kansas, Lawrence, Kan., will visit the various centers and assist the sub-committees in organizing and carrying on their work.

The executive board considered a communication from the Washington Society of Engineers requesting the federated societies to develop plans whereby local engineering groups might take a prominent part in comprehensive metropolitan planning. The matter will be brought to the attention of the member societies. A request was received from the Cleveland Engineering Society that the federation support the movement for a technical commission, created by Congress to make a thorough study of the engineering and economic phases of the proposed St. Lawrence waterway before making a decision.

An invitation was received from the Association of Engineers and Architects of Czechoslovakia for the Federated American Engineering Societies to have representatives attend its annual meeting in Kasic, July 2 to 8. President Cooley was authorized to appoint representatives. The executive board voted to participate in the world power conference to be held in London in 1924 and authorized the appointment of representatives. The board accepted an invitation from the Chamber of Commerce of Rochester, N. Y., to hold its next meeting there during the first two weeks in October.

Sales of Mechanical Stokers

WASHINGTON, June 18.—The Department of Commerce announces the sales of mechanical stokers for 1923, by months, according to the returns made by 15 establishments reporting to the Bureau of the Census, as follows:

			Installed Under Fire Tube Boilers		Installed Under Water Tube Boilers	
Month	Number of Stokers Sold	Total Horse-power of Stokers Sold	Total Number	Total Horse-power	Total Number	Total Horse-power
January	145	83,270	29	3,400	116	79,870
February	129	66,619	9	1,172	120	65,447
March	120	68,955	9	1,259	111	67,696
April	167	85,339	14	2,000	153	83,339
May	194	100,513	14	1,915	180	98,598
5 months	755	404,696	75	9,746	680	394,950

It will be noted that the average size of stoker placed under water tube boilers is much larger than under fire tube boilers—581 hp. against 130 hp.—and that the water tube boilers absorb nearly 98 per cent of the total horsepower installed.

Machinery Markets and News of the Works

HEAVY BUYING AT CHICAGO

Railroads Place Orders Totaling Several Hundred Thousand Dollars

Santa Fe, Chicago & Northwestern, Rock Island and Union Pacific Make Purchases

The most important machine-tool activity of the week has been at Chicago, where large railroad orders were placed. The Santa Fe concluded its purchases, the total being about $300,000, and the Chicago & North Western closed for the bulk of its list, its purchases involving about $150,000. Smaller lots of tools were bought by the Rock Island Lines and the Union Pacific. Action on the inquiries of the Elgin, Joliet & Eastern and the Denver & Rio Grande Western has been further delayed, while the Burlington is not expected to buy for several weeks.

Railroad buying occupies the center of interest throughout the country in view of the decline in demand from other sources. The great amount of work which the American Locomotive Co. has on hand requires additional shop equipment, eight large machines having been bought by this company last week. The New York, New Haven & Hartford has inquired for two metalworking tools and several woodworking machines. Early action is expected on the inquiries of the Norfolk & Western, Pere Marquette and Central Railroad of New Jersey. The Chicago, Milwaukee & St. Paul is reported to have a large list of tools ready for issuance as soon as appropriations are approved.

The largest pending inquiry from an industrial company is that of the Westinghouse Electric & Mfg. Co., which requires about 75 tools for its new transformer plant at Sharon, Pa., and 14 tools for its East Pittsburgh works.

New York

NEW YORK, June 19.

THE most important machine-tool buying of the week was done by the American Locomotive Co., New York, which purchased eight tools as follows: One 6-ft. radial drill, one 5-ft. radial drill, one 60-in. planer, one locomotive axle and journal turning lathe, one double traveling head shaper, one 32-in. standard shaper, one boring mill, one 100-in. wheel boring and turning mill. The New York, New Haven & Hartford Railroad has inquired for a punching machine, an upright drill and several woodworking machines. No action is reported on the recent list of the Norfolk & Western Railroad. Demand for tools from industrial companies continues in fair volume without unusual features.

The Ready Machine Co., 396 Third Avenue, Troy, N. Y., has plans for a new one-story machine shop, 45 x 75 ft., at 244 Fifth Avenue, to cost $17,000. George R. Tarbox, company address, is architect.

Morris Loewy, 200 Fifth Avenue, New York, machinery dealer, has inquiries out for a baling press.

The United States Navy Purchasing Office, South and Whitehall Streets, New York, will take bids at once for one clamshell coaling bucket; also for one acetylene generator.

Fire, June 11, destroyed a portion of the woodworking and millworking plant of the Feldman Parlor Frame Corporation, 198-212 Seigel Street, Brooklyn, with loss estimated at $300,000, including machinery and stock. Max Feldman heads the company.

Peter B. Cerussi, 4582 Third Avenue, New York, operating a marble and tile works, is taking bids until June 28 for a new five-story building, 50 x 136 ft., at Belmont Avenue and Fordham Road, to cost $175,000. Charles Kreymborg, 2534 Marion Avenue, is architect.

Stone & Webster, Inc., 120 Broadway, New York, and 147 Milk Street, Boston, engineer, has taken over and will operate in the future the power plant and transmission system of the West India Electric Co., Ltd., and the Jamaica Public Service Co., Ltd., Kingston, Jamaica. The companies are now being consolidated and have plans for extensions and the installation of additional equipment.

The New York Edison Co., 130 East Fifteenth Street, New York, will commence the erection of a new power house, 25 x 100 ft., at 127 East 120th Street. William Whitehill, 709 Sixth Avenue, is architect.

Power and conveying machinery and other equipment will be installed in the two-story plant, 100 x 120 ft., to be erected on Elizabeth Street, Utica, N. Y., by the Utica Baking Co., 610 Jay Street, estimated to cost $60,000.

The Rubel Coal & Ice Corporation, Glenmore Avenue and Junius Street, Brooklyn, will commence the erection of a one-story addition to its ice-manufacturing plant at 2143-65 Tilden Avenue, to cost about $100,000.

The Realty Managers, Inc., 342 Madison Avenue, New York, has purchased a block of property on 170th Street, from Inwood to Cromwell Avenue, as a site for an ice-manufacturing and refrigerating plant to cost approximately $1,000,000, for which plans will soon be drawn.

Mechanical conveyors, motors, hoppers, and other equipment will be installed in the new steel and reinforced-concrete grain elevator to be constructed by the New York State Canal Board, Albany, at the Barge Canal Terminal, Front Street, Troy, N. Y., to cost approximately $1,000,000 with machinery.

The Texas Pacific Coal & Oil Co., 24 Broad Street, New York, is planning for a stock issue of $1,000,000, the proceeds to be used for the construction or acquisition of an oil refinery, with auxiliary units for lubricating oil and gasoline production.

The Anaconda Copper Mining Co., 25 Broadway, New York, has negotiations in progress for the purchase of the National Conduit & Cable Co., 17 East Forty-second Street, and purposes to expand the brass works of the last noted company, as well as the rod and wire mill at Hastings-on-Hudson, N. Y. The property will be acquired for about $3,000,000.

The Mergenthaler Linotype Co., 29 Ryerson Street, Brooklyn, manufacturer of typesetting machines, has leased three floors in the factory at 68-72 Emerson Place, for extensions.

The Eclipse Machine Co., Elmira, N. Y., manufacturer of brakes, clutches, etc., has leased a portion of the Lipton Building, Hoboken, N. J., totaling 21,000 sq. ft., for a factory branch.

The Pennsylvania Railroad Co., Pennsylvania Terminal, New York, will build a new engine house and shop at its repair works on Waldo Avenue, Jersey City, N. J., to cost $75,000.

Manual training equipment will be installed in the new two-story and basement high school to be erected at Matawan, N. J., estimated to cost $130,000, for which bids will be taken at once on a general contract. John N. Pierson & Son, Raritan Building, Perth Amboy, N. J., are architects.

The Manhattan Rubber Mfg. Co., 120 Broadway, New York, manufacturer of mechanical rubber products, will build an addition to its plant at Malapardis, near Morristown, N. J., to cost $40,000.

The Jersey Central Power & Light Co., Morristown, N. J., operated by A. E. Fitkin & Co., 165 Broadway, New York, is disposing of a preferred stock issue of $1,156,000, a portion of the proceeds to be used for extensions and improvements in electric generating plants and system.

A manual training department will be installed in the

The Crane Market

FEW new crane inquiries have appeared in the past week and the number of orders reported is small. The locomotive crane market is still slightly more active than the market on overhead traveling cranes. Purchase of from one to six 70-ton overhead traveling cranes by the Baldwin Locomotive Works, Philadelphia, has been postponed indefinitely. While the list of 10 overhead cranes recently issued by the General Electric Co. is still pending, a 10-ton crane, previously inquired for, is reported to have been purchased for Pittsfield, Mass. There is a strong demand for used locomotive cranes and dealers in used equipment report difficulty in obtaining sufficient cranes in good condition. Among current inquiries for electric overhead cranes is one from the Westinghouse Electric & Mfg. Co., Philadelphia, for two 10-ton, 47-ft. span cranes, and a list of five cranes, including two 5-ton, one 10-ton and two 3-ton cranes from the Westinghouse Electric & Mfg. Co., Pittsburgh, for its new transformer plant at Sharon, Pa. A recent purchase of two sizable overhead traveling cranes was made by the Norfolk & Western Railroad, Norfolk, Va., which has closed on two of 150 tons' capacity. M. W. Kellogg & Co., Jersey City, N. J., has closed on a 40-ton, 80-ft. span overhead traveling crane with a 10-ton auxiliary.

Among recent purchases are:

Hudson Coal Co., Scranton, Pa., a 10-ton electric traveling crane from the Whiting Corporation.

Pierce, Butler & Pierce Mfg. Corporation, New York, four 5-ton hand power cranes for Zanesville, Ohio, from the Whiting Corporation.

Cuban American Sugar Co., 129 Front Street, New York, a 10-ton hand power crane for Cuba, from the Whiting Corporation.

Chandler Construction Co., East Bridgewater, Mass., a 3-ton, 13-ft. span power crane, from H. D. Conkey & Co.

Central Construction Co., Harrisburg, Pa., a 20-ton used Ohio locomotive crane, from Philip T. King, 30 Church Street, New York.

Harrison Engineering Co., Buffalo, N. Y., a 20-ton used Ohio locomotive crane, from Philip T. King, 30 Church Street, New York.

National Radiator Co., Johnstown, Pa., a cupola charging crane, 39-ft. 6-in. span, 3-motor, from the Milwaukee Electric Crane & Mfg. Co.

proposed junior high school to be erected at Westfield, N. J., for which an appropriation of $725,000 is being arranged. The Board of Education is in charge.

Fire, June 12, destroyed a portion of the plant of L. A. Zwiller, Peapack, N. J., manufacturer of paper products, comprising a one-story structure, 40 x 200 ft., with L-extension 80 ft. long, with loss estimated at $25,000. Plans for rebuilding are being considered.

Manual training equipment will be installed in the two-story high school to be erected at Hightstown, N. J., estimated to cost $150,000, for which bids will soon be called on revised plans. Guilbert & Betelle, Chamber of Commerce Building, Newark, are architects.

The Scott Lumber Co., Mantua, N. J., is planning the installation of additional machinery at its mill, including saws, planers, etc.

The Magnum Rubber Products Corporation, Garfield, N. J., recently formed under Delaware laws with capital of $21,000,000, has acquired the plant of the Smith Rubber & Tire Co., Saddle River Township, near Garfield, bankrupt. The new owner will take immediate possession and plans for extensions. Automobile tires and other rubber products will be manufactured.

The New Jersey Power & Light Co., Dover, N. J., has abandoned plans for its proposed new electric generating plant at Holland, near Milford, N. J., and all work will be discontinued until further notice.

The Whitall-Tatum Co., 46 Barclay Street, New York, is perfecting plans for new buildings at its glass container manufacturing plant at Millville, N. J., including the installation of equipment, to relpace the portion of the works recently destroyed by fire with loss approximating $100,000.

The Public Service Electric Power Co., Public Service Terminal, Newark, a subsidiary of the Public Service Corporation, has closed negotiations with the Common Council, Kearny, N. J., for a site on the Hackensack River, between the Lincoln Highway and the Newark Turnpike, for its new steam-operated electric power plant. It will have an initial capacity of 200,000 hp., which ultimately will be doubled, and is estimated to cost $2,500,000 with transmission system. The Public Service Gas Co., a subsidiary organization, is arranging for a stock issue of $6,000,000, the proceeds to be used for a new plant and extensions in present works and system.

The Whittier Lumber & Millwork Co., foot of Adams Street, Newark, manufacturer of sash, doors, etc., will have plans prepared for immediately rebuilding the portion of its plant destroyed by fire June 14, with loss estimated at $100,000 including machinery. John G. Whittier is head.

The Animate Toy Co., 30 North Fifteenth Street, East Orange, N. J., has inquiries out for a stamping press, second-hand.

C. & S. Schwicher, 312-20 Passaic Avenue, Newark, will commence the construction of a new one-story foundry to cost about $16,000.

The Ballard Oil Equipment Co., 142 Pearl Street, New York, manufacturer of fuel oil burning equipment and systems, has purchased the former plant of the Schofield Oil Co., Passaic River, Newark, comprising more than 5 1/2 acres with a number of buildings. The new owner purposes to use a portion of the plant for general manufacture, while the other part will be equipped as an oil storage and distributing works. Arthur H. Ballard is president.

The Drake Mfg. Co., Inc., Friendship, N. Y., recently received an order from the Westinghouse Electric & Manufacturing Co., Pittsburgh, for seven of its 1/2-ton motohoists.

Catalogs Wanted

The McCabe & Shearan Machinery Corporation, 50 Church Street, New York, has been authorized to procure information and later expects to make purchases totaling millions of dollars for a large foreign company. Catalogs in triplicate are desired of machine tools and accessories, woodworking machinery and power plant equipment.

New England

BOSTON, June 18.

A SLIGHT improvement is noted in sales of individual machine tools without, however, very much betterment in the aggregate business the past week. Stone & Webster, Boston, have purchased a 15-in. Potter & Johnson shaper, a 26-in. x 12-ft. lathe and a 3-ft. Dreses radial drill with motors for a Middle West plant. A local machine shop has taken a new 16-in. x 8-ft. medium priced lathe, a new two-spindle drill and a used key seater. A Maine shop bought a similar lathe, a new 20-in. drill press and a used miller and a shaper, while a Burlington, Vt., firm closed on a used 150-lb. hammer and a new 36-in. band saw. Of the other business reported, the most important involves a new 4-in. pipe machine to a Westfield, Mass., foundry; a new 12-in. lathe and 16-in. shaper to a Framingham, Mass., shop; and a used vertical miller and a large filing machine to a Gardner, Mass., manufacturer.

One local house reports an aggregate of $15,000 worth of business pending with Connecticut concerns. There has been a decided lull in buying of tools in that State. Such a condition is attributed in part, at least, to the auction sale Wednesday, June 20, of the equipment of the Atlas Machinery Co., 55 Wyman Street, Waterbury, Conn. New inquiries were few and far between the past week. The Rutland Railroad is in the market for two small machines, while the General Electric Co., West Lynn, Mass., although the appropriation has not been made, is inquiring for three or four lathes.

The Boston & Maine Railroad, North Station, Boston, has awarded contract for a sizable addition to its blacksmith shop, Billerica, Mass.

Work will start shortly on an addition and alterations to the Springfield, Mass., plant of the Winchester Repeating Arms Co., 275 Winchester Avenue, New Haven, Conn.

A conveyor system, motor driven automatic boiler feed pump and other mechanical equipment, as well as steel lockers, are required for a plant being erected by the Sawtucket Dairy Co., East Bridgewater, Mass.

M. H. Merrill, 50 State Street, Boston, engineer, is taking bids for a three-story addition to the engine room and machine shop of the Shawmut Engineering Co., 195 Freeport Street, Dorchester, Boston.

Contract has been awarded for a one-story power house to be erected for the Stevens Mill, North Andover, Mass., to cost approximately $100,000.

Excavating is going on for a one-story, 60 x 126 ft. woodworking mill to be erected by the Z. B. Davis Corporation, 668 Acushnet Avenue, New Bedford, Mass. Zebina B. Davis is president.

Foundations are in for a new one-story, 64 x 139 ft. pattern shop to be erected by the General Electric Co., West Lynn, Mass., the cost of which will be $50,000 to $60,000.

New York textile specialty interests are negotiating for the purchase of the Century Machinery Corporation, South Main Street, Holyoke, Mass., plant, now owned by the Casper Ranger Construction Co.

Construction is under way on a new one-story foundry at the plant of the Hopedale Mfg. Co., Milford, Mass., manufacturer of textile machinery and parts, to cost $28,000. The H. M. Hope Engineering Co., 230 Boylston Street, Boston, is engineer.

The Missisquoi Pulp & Paper Co., Sheldon Springs, Vt., will install a complete new power plant unit at its bristol board mill, with concrete stack, for which plans will be prepared at once. It will cost $85,000.

Manual training equipment will be installed in the new high school to be erected at Ellsworth, Me., estimated to cost $100,000. Bunker & Savage, Augusta Trust Building, Augusta, Me., are architects.

The Hopkins Mfg. Co., 80 Boylston Street, Boston, manufacturer of machinery, is taking bids on a general contract for the erection of a one-story addition. Byron E. Porter, 73 Tremont Street, is architect.

The Connecticut Power Co., 335 Main Street, Middletown, Conn., has plans for an addtion to its local power house to develop sufficient capacity for central station service at Portland, Middlefield, Durham and vicinity. The engineering department of the Hartford Electric Light Co., Hartford, Conn., is in charge. Stone & Webster, Inc., 147 Milk Street, Boston, is consulting engineer.

The Bristol Co., Waterbury, Conn., manufacturer of measuring instruments, has taken bids for a large two-story addition to its plant in the Platts Mills section. Fred A. Webster, Waterbury, is architect.

The Eastern Massachusetts Street Railway Co., 1 Beacon Street, Boston, will build a new electric substation at Lynn, Mass., to cost about $125,000. The installation will consist of three 1500 kw. rotary converters, control equipment and auxiliary apparatus. Provision will be made for doubling the initial capacity later. The company will abandon operations at its Lynn power plant, which has been in service for more than 25 years.

The New England Oil Co., New Street, Fall River, Mass., will make extensions in its refinery and install additional equipment to cost $35,000.

The Ware Foundry Co., Ware, Mass., has authorized plans for rebuilding the portion of its plant destroyed by fire June 7, with loss estimated at $21,000.

The Cook-Dunbar-Smith Co., Providence, R. I., manufacturing jeweler, has purchased the factory of the W. J. Feeley Co., South Angell Street. Extensions will be made and precision lathes, bench tools and other equipment installed. The present business will be removed to the new location. The company has abandoned plans for the constructioin of a new plant on Eddy Street, recently announced.

The Watertown Mfg. Co., Watertown Street, Watertown, Conn., manufacturer of insulating products, has awarded contract to the H. Wales Lines Co., Meriden, Conn., for a one-story addition, 70 x 120 ft., estimated to cost $50,000.

A one-story power plant with capacity of about 2000 hp. will be constructed at the textile mills of the M. T. Stevens & Sons Co., North Andover, Mass., to cost in excess of $70,000.

The Edison Electric Illuminating Co., 39 Boylston Street, Boston, plans the construction of a one-story machine and repair shop to cost $25,000.

The Salisbury Mfg. Co., Providence, manufacturer of tags, labels and kindred products, has acquired a building at Sandwich for a new plant. Extensions will be made and machinery installed at an early date.

The Colt's Patent Fire Arms Co., Huyshope Avenue, Hartford, Conn., has awarded a general contract to R. O. Bent, 183 Ann Street, for improvements in one of its plant buildings to provide for the installation of new overhead machinery.

The Fresh Pond Ice Co., Somerville, Mass., has tentative plans for rebuilding the portion of its plant in the rear of 321 Washington Street, destroyed by fire June 8 with loss estimated at $50,000, including equipment.

Philadelphia

PHILADELPHIA, June 18.

CONTRACT has been awarded by the Kitson Co., 2819 Oakford Street, Philadelphia, manufacturer of pipe, plumbing equipment, etc., to the William Steele & Sons Co., 219 North Broad Street, for the erection of a one-story machine shop, to cost about $60,000.

The Philadelphia Suburban Co., West Washington Square, Philadelphia, comprising a recent merger of the Philadelphia Suburban Gas & Electric Co., and other electric utilities, will commence the construction of a new generating plant at Oreland, Pa., where 14 acres have been secured. The initial unit will cost approximately $1,500,000; another unit will be built later to cost a like amount.

The Budd Wheel Corporation, Twenty-third and Westmoreland Streets, Philadelphia, manufacturer of pressed steel and wire wheels, has arranged for an increase in capital from 50,000 to 100,000 shares of stock, no par value, the proceeds to be used for expansion.

Manual training equipment will be installed in the junior high school to be erected on Lancaster Avenue, Overbrook section, West Philadelphia, estimated to cost about $1,000,000, for which plans will soon be prepared by the Board of Education.

S. S. Redifer & Co., Inc., Philadelphia, has been chartered under State laws to take over and expand the business of the company of the same name, with plant at 139 Race Street, manufacturer of iron shoe lasts, etc. An addition is now in course of erection. A. P. Redifer, Jr., is treasurer.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until June 26 for one precision tool bench and equipment, motor-driven, for the Philadelphia Navy Yard, schedule 954; also, for 200 gear-type, engine-driven fuel pumps, schedule 955, and 90,000 ft. of aircraft cable, schedule 961.

The Chamber of Commerce, Twelfth and Walnut Streets, Philadelphia, has received an inquiry from Mexico for American machinery for the manufacture of small wire products.

The Sun Oil Co., Finance Building, Philadelphia, formerly known as the Sun Co., operating oil refineries, is disposing of a note issue of $4,000,000, a portion of the proceeds to be used for extension and improvements. J. Howard Pew is president.

The Philadelphia Commercial Museum, Thirty-fourth Street, has received an inquiry from a company at Malaga, Spain, for American machinery for the manufacture of metal straps, hoops, bands, etc. Also, from a concern at Messina, Asia Minor, for hydraulic presses for cotton compress service.

The Franklin Institute, 15 South Seventh Street, Philadelphia, will remodel four buildings at Nineteenth and Race Streets, under the direction of the Henry W. Bartol Research Foundation of the institute, for the establishment of new laboratories, consisting of about twenty rooms, equipped with electrical and mechanical precision apparatus for complete experimental research.

The Haines, Jones & Cadbury Co., 1136 Ridge Street, Philadelphia, manufacturer of plumbing equipment and supplies, is arranging for an increase in capital from $250,000 to $1,500,000, at a meeting to be held June 27, a portion of the proceeds to be used for expansion.

Fire, June 11, destroyed a portion of the plant of the Certain-teed Products Co., East State Street, Trenton, N. J., manufacturer of roofing products, etc., including mechanical drying departments, with loss estimated at $250,000, with equipment. It is planned to rebuild. Headquarters of the company are in the Woolworth Building, New York. J. C. Wallace is manager at the Trenton works.

Bids will be received by the Board of Freeholders, Trenton, N. J., until July 3 for a new crushing plant, with motors and auxiliary equipment, for installation at the County quarry property, Moore's Station. The crusher is estimated to cost $60,000. Bids received on a former call have been rejected. H. Eltinge Breed, 507 Fifth Avenue, New York, is consulting engineer.

The Boyle Ice Co., Huntingdon, Pa., has plans for a new ice-manufacturing and cold storage plant to cost $85,000.

The Pennsylvania Power & Light Co., Allentown, Pa., is perfecting arrangements for the purchase of the plant and system of the Coopersburg Electric Light, Heat & Power Co., Coopersburg, Pa. Extension and improvements will be made, including the installation of additional equipment.

Fire, June 12, destroyed a portion of the plant of the Penn Planing Mill Co., Second and Grape Streets, Reading, Pa., with loss approximating $75,000, including equipment. It is planned to rebuild.

The Gibbs Metal Container Co., Columbia, Pa., has perfected plans for the operation of a new plant for the manu-

facture of metal cans, boxes, etc., at Tenth and Blunston Streets. The initial output will be increased in the near future. J. C. Gibbs is president.

The Grantville Electric Co., Grantville, Pa., has been organized under State laws to install and operate an electric plant and system. It is headed by H. C. Stambaugh and S. S. Seyfert, both of Grantville.

The Jeddo-Highland Coal Co., Highland, near Hazleton, Pa., is planning for the installation of electrical and mechanical equipment at its local properties, now being opened under the direction of the Central Pennsylvania Stripping, Quarry & Construction Co.

The Edison Electric Light & Power Co., York, Pa., is completing negotiations for the purchase of the plant and system of the Delta Electric Power Co., and the Delta Water & Power Co., Delta, York County. Extensions will be made in the plants and transmission system.

A one-story power house will be constructed at the proposed textile mill of the New York Silk Mfg. Syndicate, care of the Business Men's Association, Nanty Glo, Pa., estimated to cost $145,000.

The Penn Central Power Co., Altoona, Pa., is planning for the installation of electric power and mechanical equipment at its coal properties in Huntingdon and Bedford counties, recently acquired from the Kay Coal Mining Co.

Manual training equipment will be installed in the new three-story high school addition to be constructed at Jersey Shore, Pa., estimated to cost $150,000. E. Arthur Rianhard, Masonic Temple Building, Williamsport, Pa., is architect.

Bids will be received by Remington & Vosbury, 601 Market Street, Camden, N. J., engineers, until June 25 for the installation of a pumping plant and system for the municipal waterworks at Pennington, N. J.

Pittsburgh

PITTSBURGH, June 18.

WHILE machine tool orders in this district have not been as numerous as the trade could wish, they have been in fairly good volume, and as a good deal of business is pending, the expectation is that the month will make a good showing in comparison with the past few. Some action is looked for shortly in connection with the list of the Westinghouse Electric & Mfg. Co., which calls for 75 tools for the new transformer plant at Sharon, Pa., and 14 tools for its East Pittsburgh Works. Fairly prominent in the current trading are squaring shears. The local representative handling Niagara shears within the past week has sold four in the Wheeling district.

An appraisal recently was made of the damage done to the machine shop of the Shenango Furnace Co., Sharpsville, Pa., and that company now is in the market for a 60-in. boring mill, a 20-in. lathe, 24-in. drill press and a 20-in. shaper. These tools are all motor-driven, running on 220 volts, d.c.

The crane market shows very little activity in the way of sales, but much business is pending, which it is hoped will materialize before long into orders. The present disposition of buyers seems to be to delay closing until there is a little more definite line on the future of business.

Plans have been filed by the Bessemer Gas Engine Co., Grove City, Pa., for a new one-story, steel and reinforced-concrete addition to cost $35,000.

A manual training department will be installed in the new three-story junior high school to be erected on Duss Avenue, Ambridge, Pa., estimated to cost $385,000, for which bids will soon be asked on a general contract. W. Ward Williams, 309 Fourth Avenue, Pittsburgh, is architect.

The Borough Clerk, G. Walter Bauer, Millvale, Pa., will receive bids until July 10 for pumping machinery for the local waterworks, consisting of one 2,000,000-gal. capacity vertical shaft motor-driven pump, with shafting; and one centrifugal pump, same capacity, horizontal direct-connected motor driven. The J. N. Chester Engineers, Union Bank Building, Pittsburgh, are engineers.

Fire, June 7, caused by lightning, destroyed a portion of the power plant of the American Gas & Electric Co., Beech Bottom, W. Va., with loss estimated at $50,000 including equipment. It will be rebuilt. Headquarters are at 30 Church Street, New York.

The Kerr Portland Cement Co., Wheeling, W. Va., has secured about 800 acres at Beech Bottom, W. Va., as a site for a new plant with initial capacity of about 3000 bbl. per day. The works will approximate 80 acres of floor space, and will include a power house and machine shop. The estimated cost is placed at $1,300,000.

The Eastern Sewer Pipe & Brick Co., Martinsburg, W. Va., recently organized with a capital of $350,000, plans the establishment of works for the manufacture of sewer pipe, hollow tile and kindred products. It is estimated to cost $100,000, with machinery. F. Vernon Aler, Martinsburg, is president; Martin J. Beach, Calvert Building, Baltimore, is secretary.

The Consolidated Power & Light Co., Huntington, W. Va., is disposing of a preferred stock issue of $1,500,000, a large portion of the proceeds to be used for extensions and improvements, including the completion of a power plant addition, now in progress at the Kenova station. Van Horn Ely is president.

Manual training equipment will be installed in the two and three-story high school to be erected at River Plains, Woodlawn, Pa., estimated to cost $500,000, for which the Board of Education has authorized preparation of revised plans. Carlisle & Sharrer, Jenkins Arcade Building, Pittsburgh, are architects.

The McGraw Motor Co., Wheeling, W. Va., will install a machine shop and parts department in its new building at Twenty-first and Main Streets, estimated to cost $100,000. Fred Faris, Wheeling, is architect.

The Quaker Coal Co., Gilmer, W. Va., recently organized with a capital of $250,000, will install electric power and mechanical equipment on its local properties. R. R. Biddle, head of Biddle & Co., Inc., 1001 Chestnut Street, Philadelphia, brokers, is president.

The Common Council, Webster Springs, W. Va., will commence the construction of a municipal electric power plant on the Elk River, Cherry Falls, for which citizens recently approved an appropriation. Transmission lines will be built.

The Killarney Smokeless Coal Co., Killarney, W. Va., is planning the installation of electrical and mechanical equipment at its local properties.

The Board of Education, superintendent of buildings, 1326 Fulton Building, Pittsburgh, will receive bids until July 5 for the installation of electric equipment, boilers, temperature regulating devices, etc., at the proposed Boggs Avenue School. George W. Gerwig is secretary.

The Buckhannon Brick Co., Buckhannon, W. Va., has inquiries out for a used steam shovel, about ½-yd. capacity.

The Fairmont-Chicago Coal Co., Fairmont, W. Va., will build a new tipple at its Chesapeake mine, near Barrackville, W. Va., estimated to cost $100,000 with machinery, and will also install considerable other equipment.

The Automatic Time Poultry Feeder Co., Fairmont, W. Va., recently organized, plans the establishment of a factory for the manufacture of mechanical timing and automatic devices. Emmett J. O'Neill and Hubert T. White, head the company.

Baltimore

BALTIMORE, June 18.

PLANS are being completed for extensions and improvements in the repair shops and yards of the Baltimore & Ohio Railroad Co., Baltimore, at Grafton, W. Va., including the construction of additional buildings, new steel coal tipple, turntables and other work, to cost $600,000, including machinery.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until June 25 for equipment for installation at the power plant at the Naval Academy, Annapolis, Md., including crane with bucket cable; coal-weighing and handling equipment, with drag scraper system of coal storage; machinery, scales and tar puller.

The Locke Insulator Co., Charles and Cromwell Streets, Baltimore, manufacturer of high-tension electrical insulators, has plans for the erection of two additions, 60 x 80 ft., and 33 x 40 ft. Parker, Thomas & Rice, Union Trust Building, are architects.

L. A. Wilson, Newberry, S. C., is organizing a company to build and operate a brick manufacturing plant on neighboring site, estimated to cost $55,000, with equipment. A power house will be installed.

The Roaring Springs Marl Co., Gloucester, Va., is inquiring for a 50 to 100-hp. engine, boiler and auxiliary power house equipment; also, for one steam shovel, about ¾-yd. capacity, tractor type; and for one 20 to 30-hp. hoisting engine, with double drums, suitable for cableway or drag line service.

R. S. Gilson, 1811 West Broad Street, Richmond, Va., operating a machine works, is planning for the installation of a lathe, emery wheel and stand, and other equipment.

Manual training equipment will be installed in the proposed new high school to be erected at Marion, S. C., for

which a special election has been called on June 22, to vote bonds for $100,000. High School District No. 1, Henry Mullins, chairman, is in charge.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until June 26 for four 7½-hp. motors, controllers, and four sets of spare parts for the Hampton Roads Navy Yard, schedule 953; until July 3 for one 200-kw. motor-generator set complete, with four-panel switchboard, for the Mare Island Navy Yard, schedule 943.

The Hackley-Morrison Co., Inc., 1708 Lewis Street, Richmond, Va., machinery dealer, has inquiries out for one 100 to 150 kw. engine-generator set, side crank, second-hand; also, for 25 starters for a.c. motors, from 7½ to 20 hp., 220 and 440 volts, and for two belt-driven air compressors, 12 x 14 in. and 10 x 10 in. respectively.

The W. M. Layton Brick Co., Four Oaks, N. C., has leased the plant of the Meadow Brick Co. and will operate for a daily production of about 40,000 brick. Improvements will be made and equipment installed, including power apparatus. W. M. Layton is head.

The Blue Ridge Power Co., Tuxedo, N. C., will commence the construction of a hydroelectric power plant on the Green River, near Turner Shoals, to develop a capacity of 10,000 hp. Three generating units and auxiliary machinery will be installed, and transmission lines constructed. A new electric substation will be built in the vicinity of Spartanburg, S. C. The company has recently increased its capital from $700,000 to $2,100,000 for expansion. John A. Law is treasurer.

The Atlantic Coast Line Railroad, Wilmington, N. C., will build additions to its locomotive and car repair shops, and install considerable machinery, to cost in excess of $350,000.

The R. C. Belk Sand Co., P. O. Box 157, Mount Holly, N. C., will install a steam shovel and other equipment on its local sand properties, soon to be developed. R. C. Belk heads the company.

The Charlotte Woodworking Mfg. Co., Charlotte, N. C., recently organized with a capital of $75,000, has awarded a general contract to J. P. Probst, Church Street, for a one-story plant, 72 x 145 ft., and will install machinery for cabinet manufacture and general millwork, including lathes, planers, saws, conveying apparatus, etc. Louis H. Asbury, Realty Building, Charlotte, is president.

The Chesapeake & Ohio Railroad Co., East Main Street, Richmond, Va., will install two 20-ton capacity locomotive cranes at its yards at Huntington, W. Va. R. M. Nelson is purchasing agent.

The Collins Granite Co., Danville, Va., R. F. D. No. 4, has inquiries out for a belt-driven air compressor, 12 x 14 in., second-hand.

D. L. Claville, 906 East Cary Street, Richmond, Va., operating a machine repair works, is planning the installation of a lathe and boring machine for cylinder and other work.

Manual training equipment will be installed in the new high school to be erected at Nashville, N. C., estimated to cost about $90,000. Benton & Benton, Wilson, N. C., are architects.

The Southern States Lumber Co., Charleston, S. C., recently organized with a capital of $500,000, is said to be planning the construction of a new mill, with power house, estimated to cost $100,000. B. O. Elting is president.

The Dorchester Lumber Co., Badham, S. C., is in the market for an 8-ft. band mill, 16 ft. carriage, with 10 in. steam feed.

R. P. Johnson, Wytheville, Va., machinery dealer, has inquiries out for a mine hoist, 50 to 75 hp., with main drum, to carry about 2000 ft. of ⅞-in. cable; also, for a 40 to 60 hp. mine hoist, single or double drum, with or without boiler, main drum to carry about 2500 ft. of ⅞-in. cable.

The Henderson Water Co., Henderson, N. C., has tentative plans for the installation of additional electrically-operated pumping machinery at its plant. The company recently increased its capital from $100,000 to $300,000, for expansion. J. R. Teague is secretary.

The Union Cotton Oil Co., Fitzgerald, Ga., is perfecting plans for a new mill to cost about $50,000, including equipment.

The Taylor Lumber Co., Rutherfordton, N. C., is arranging for the erection of a new plant, comprising three one-story buildings, 55 x 80 ft., 25 x 75 ft., and 20 x 80 ft. respectively, for general cabinet manufacture and mill work. A power house will also be installed. J. L. Taylor is head.

The City Council, Greensboro, N. C., is considering the installation of additional equipment at the municipal pumping plant.

A one-story power house, ice and refrigerating plant will be installed at the new John D. Archbold Memorial Hospital, Thomasville, Ga., estimated to cost $1,000,000, for which plans are being drawn by E. C. Wachendorff, 620 Forsyth Building, Atlanta, Ga., architect.

John H. Perry, Navy Yard, S. C., R. F. D. No. 2, P. O. Box 151, is in the market for dies for sheet-metal stamping and other equipment for punching special metal shapes.

Buffalo

BUFFALO, June 18.

CONSTRUCTION will commence on a new one-story machine shop for the Ross Heating Co., West Avenue, Buffalo, location noted, estimated to cost $15,000.

The W. M. Miller Co., Main Street and Central Avenue, Owego, N. Y., is planning the installation of a tool-maker's lathe, portable drill and other equipment at its machine shop.

The Swan & Finch Co., 522 Fifth Avenue, New York, manufacturer of lubricating oils, etc., has acquired the plant and business of the N. B. Falls Lubricating Co., Prudential Building, Buffalo. Tentative plans are under consideration for extensions in the refining and compounding works.

The Northern New York Utilities, Inc., Watertown, N. Y., is disposing of a new bond issue of $2,212,200, a portion of the proceeds to be used for power plant and transmission line construction. J. N. Carlisle is president. The Power Corporation of New York, same address, an affiliated organization, has commissioned W. P. Creager, Northern New York Trust Building, Watertown, engineer, to prepare plans for a hydroelectric generating plant on the Racquette River, near Norwood, N. Y., to cost approximately $750,000.

J. R. & M. L. Melvin, 709 East Water Street, Elmira, N. Y., are planning for the erection of an addition to their machine shop at Water and High Streets, to cost $35,000.

The Nash-Buffalo Corporation, 21-23 Northampton Street, Buffalo, local representative for the Nash automobile, has purchased the factory of the Harvey Rim & Wheel Co., Jewett Avenue, and the New York Central Railroad, for $100,000. The new owner will establish a repair and machine works, parts department and service station at the new location, and will remove its present business there.

The Payne & West Co., 11 Collier Street, Binghamton, N. Y., operating a welding and brazing works, is planning for the installation of heavy duty acetylene welding equipment.

The Chemung Foundry Co., 500 Erie Street, Elmira, N. Y., is perfecting plans for a one-story addition.

The Standard Oil Co. of New York, 26 Broadway, New York, has acquired land near Stark Street, Tonawanda, N. Y., and plans the erection of an oil storage and distributing plant, to cost in excess of $100,000, with equipment. The company is also planning the construction of a machine shop and service works for company trucks and automobiles at Lake and Fifth Streets, Elmira, N. Y., to cost about $55,000. A. E. Carr, 1001 Stowell Street, is local manager.

The Cohoes Power & Light Corporation, Cohoes, N. Y., will take bids before the end of the month for a new one-story building, 35 x 112 ft. William E. Goddard, 34 Remsen Street, is architect.

The F. Hayes Co., Mill Street, Canastota, N. Y., operating a forge shop, is planning for the installation of a power-operated angle shear.

An ice and refrigerating plant will be installed in the new meat-packing factory to be erected by the Cuff Packing & Provision Co., Inc., Buffalo, recently organized, at William and Newell Streets, 230 x 310 ft., to cost in excess of $80,000, with equipment. James J. Cuff, formerly manager at the local plant of the Jacob Dold Packing Co., is president. Joseph P. Morgan is secretary.

The W. M. Sharp Mfg. Co., 41 Wall Street, Binghamton, N. Y., operating a metal plating works, is planning for the installation of nickel-plating and other equipment. C. T. Kinsman is one of the heads of the company.

The Niagara Falls Smelting & Refining Corporation, Buffalo, recently organized, has arranged for the operation of a plant at 1070-84 Niagara Street, for the production of brass and bronze ingots, special metal alloys, etc. Other units will be constructed later. Arthur Maddigan, an official of the Hygrade Fuel & Oil Co., Buffalo, is treasurer; Ernest G. Jarvis is general manager and vice-president.

J. L. Ward, East Church and Judson Streets, Elmira, N. Y., is planning the installation of equipment at his proposed foundry for the production of brass and bronze castings.

The Rochester Gas & Electric Corporation, Clinton Avenue, Rochester, N. Y., will build an electric substation on West Swan Street, to cost about $95,000, with equipment.

Chicago

CHICAGO, June 18.

THE Santa Fe has concluded purchases of $300,000 worth of tools with the exception of a few minor items which will be purchased within the next few days. The Chicago & North Western has likewise closed for the bulk of its list, involving about $150,000. The Rock Island Lines have bought a 48-in. boring mill, a 6-ft. radial drill and a 25-40-in. gap lathe. The Union Pacific is buying a number of tools for the Oregon Short Line, but it is understood that the orders are being placed in large part with Western dealers. Action on the Elgin, Joliet & Eastern inquiry has been postponed for another week. The closing of the Denver & Rio Grande Western list has been delayed by a change of receivers. The Burlington is not likely to purchase against its pending inquiry for several weeks. Railroad buying is the center of interest in view of subsidence in demand from other sources. Inquiries from industrial sources are few and purchases are confined largely to single machines. The Board of Education, Cicero, Ill., has commenced to close against a list for the manual training department of the Cicero high school.

Kristin, Inc., recently organized with $100,000 capital stock, has leased a plant, 50 x 200 ft., at 335 East Illinois Street, Chicago, and will manufacture carburetors. It will purchase about 10 machine tools, including engine lathes, screw machines and drill presses. Officers are H. B. Snyder, president; A. J. Scully, vice-president, and D. B. Scully, secretary and treasurer.

The Harrington-Seaberg Fire Alarm Telegraph Co., recently incorporated with $50,000 capital stock, has leased a plant at 1708 Third Avenue, Moline, Ill., for the manufacture of fire alarm equipment. It has sufficient manufacturing equipment until further expansion is required. The officers are Severin Seaberg, president; Axel Carlson, vice-president; F. H. Harrington, secretary; S. Seaberg, treasurer.

The Continental Storage Battery Mfg. Co., Inc., 111 West Washington Street, Chicago, recently organized with $15,000 capital stock, has leased 4000 sq. ft. of floor space at 221 East Twenty-first Street, Chicago, to manufacture storage batteries and storage battery plates. The company has purchased a power punch press and two power mixers. Officers are J. W. McCormack, president; Ewald Brauer, vice-president and production manager; Carroll L. Bragg, treasurer and business manager, and Leo G. Herdeg, secretary.

The Expert Wood Turning Corporation, 726 South Desplaines Street, Chicago, manufacturer of floor and table lamps, has leased three- and one-story buildings at 2952-60 West Chicago Avenue, for manufacturing purposes.

The International Harvester Co., Chicago, has leased from the Board of Commissioners of the Port of New Orleans, 336,000 sq. ft. of floor space in the United States Army Supply Base at that point. It will establish a new twine manufacturing plant, employing 800 people, and will use a portion of the space for the storage of agricultural implements for export.

The F. A. Cummings Foundry Co., 1338 Cortland Street, Chicago, has let contracts for a two-story pattern shop at 2019-27 Southport Avenue, to cost $15,000.

The Peoples Power Co., Rock Island, Ill., has awarded contract for remodeling its electric power plant, to cost $25,000. New equipment will cost $50,000 additional.

The Clinton Refrigerating Co. and the Climax Engineering Co., both of Clinton, Iowa, have been merged under the name of the latter company. The products which will hereafter be manufactured will include four distinct lines: gasoline engines for every type of power-driven machinery, a new adaptation of the Diesel engine, a new steam engine installation and the Clinton refrigeration equipment for stores, hotels, dining cars, etc.

The Pettibone-Mulliken Co., 140 South Dearborn Street, Chicago, manufacturer of frogs and switches, is preparing plans for alterations to its foundry to cost approximately $20,000.

The Modern Machine Shop, 22 East Harrison Street, Danville, Ill., contemplates erecting a two-story plant.

The Forse Machine Co., Anderson, Ind., recently took possession of a plant purchased from Frank P. Foster some months ago. It has been remodeled and die-casting machines have been installed. The die-casting department will be operated independently from the window shade factory.

The Woodmanse Mfg. Co., Freeport, Ill., manufacturer of pumping machinery, windmills, etc., is planning the erection of a two-story and basement addition on Clinton Street. George E. Steenrod is president.

The State Board of Control, Capitol Building, St. Paul, Minn., is having plans prepared for extensions in its power plant at St. Peter, Minn., used for institutional buildings, estimated to cost $100,000, with equipment. The C. L. Pillsbury Co., 1200 Second Avenue, Minneapolis, Minn., is engineer. It is also planning the construction of a one-story power house addition at its laundry at St. Paul, for which C. H. Johnson, 615 Capitol Bank Building, architect, will prepare plans.

The Otis Elevator Co., Eleventh Avenue and Twenty-sixth Street, New York, will commence the erection of an addition to its branch plant at Quincy, Ill., to cost in excess of $80,000.

The Southern Railway Co., Cincinnati, is planning the erection of a planing mill and lumber plant at Princeton, Ill., to cost about $50,000, with machinery. A. A. Woods, Ingalls Building, Cincinnati, is chief engineer of maintenance of way and structures.

The Chicago & Northwestern Railroad Co., 226 West Jackson Boulevard, Chicago, is considering the construction of a new engine house and repair department at Blunt, S. D.

A manual training department will be installed in the new two-story high school to be erected at Litchfield, Ill., estimated to cost $150,000. Liese & Ludwig, Temple Building, Danville, Ill., are architects.

The Ida Grove Electric Co., Ida Grove, Iowa, is considering plans for extensions in its power plant, to cost approximately $30,000.

Manual training equipment will be installed in the new three-story high school to be erected at Marion, Iowa, estimated to cost $160,000. W. J. Brown, Bever Building, Cedar Rapids, Iowa, is architect.

The T. A. Cummings Foundry Co., 1338 Cortland Street, Chicago, has awarded contract to the Friberg Co., Chicago, for a new two-story foundry, 40 x 130 ft., at 2018 Southport Avenue, estimated to cost $15,000, exclusive of equipment.

Detroit

DETROIT, June 18.

PRELIMINARY plans are being prepared for new works at Hamtramck, Mich., by the Detroit Foundry Co., 2642 East Grand Boulevard, Detroit. A site has been acquired on Christopher Avenue. The initial unit will consist of a foundry and assembling department. Frank Bronley is treasurer.

The Hayes-Hunt Body Co., Grand Rapids, Mich., will have plans prepared for a new plant at Flint, Mich., to manufacture bodies for the Durant and Star automobiles. It will cost more than $400,000, with machinery.

The Public Lighting Commission, 174 East Atwater Street, Detroit, is having plans prepared for a new electric power plant and substation on Morrell Street. Smith, Hinchman & Grylls, 800 Marquette Building, are architects.

The Lansing Commercial Body Co., Lansing, Mich., recently organized, has arranged for its initial plant in a building at 114-16 East Franklin Street, formerly occupied by the Rork Wagon Body & Windmill Co. J. C. Ramsey and A. R. Castle head the company.

M. R. Search, 3513 Wabash Avenue, Detroit, operating a sheet-metal shop, is planning for the installation of a burring machine, turning machine, mandrel equipment and other machinery.

A manual training department will be installed in the new two-story high school to be erected at Paw Paw, Mich., estimated to cost $175,000, for which plans have been completed by E. S. Batterson, Hauselman Building, Kalamazoo, Mich., architect.

Dodge Brothers, Inc., Joseph Campau Avenue, Hamtramck, Mich., will commence the erection of an eight-story addition to its automobile plant, totaling over 400,000 sq. ft. of floor space, primarily for the manufacture of closed, all-steel car bodies. It is estimated to cost $1,500,000 with machinery. A large enameling department will be installed, with electric ovens and auxiliary equipment.

The General Machine Corporation, Benton Harbor, Mich., has been formed with a capital of $300,000 to take over and expand the Double-Drive Truck Co., with local plant for the manufacture of motor trucks. Plans are under consideration for additions, to include departments for the production of automobile parts and other automotive equipment. The manufacture of double-drive trucks will be continued.

The Pere Marquette Railroad Co. has taken out building permits aggregating $630,000 for new construction at Grand Rapids, Mich., in line with its recently announced improvement program. The work will include a brick and concrete power house, to cost $114,000; a one-story brick and concrete planing mill, to cost $54,000, and a one-story

brick and concrete locomotive and boiler shop, $462,000. The Arnold Co., Chicago, has the contract for the buildings.

The Double-Drive Truck Co., Benton Harbor, Mich., has been reorganized and reincorporated as the General Machine Corporation, with a capitalization of $300,000, of which $150,000 has been paid in. It plans to continue the production of double-drive trucks and will also manufacture other machinery and motor car parts.

Cleveland

CLEVELAND, June 18.

MACHINE-TOOL manufacturers and dealers are getting a moderate volume of scattered orders, mostly for single tools, but the aggregate business and new inquiry shows considerable falling off as compared with May. No action has been taken on the lists recently issued by the Nickel Plate Railroad and the Toledo Board of Education. Some other business in fair sized lots is pending but perspective purchasers are slow in placing orders. Little business is coming from the automobile industry although the General Motors Corporation during the week placed orders for two turret lathes for the Oldsmobile plant in Flint, Mich. Among new inquiries is one from New England for 20 turret lathes and one from France for 15.

The Reserve Iron Works, Co., Cleveland, has been organized as a partnership by Hugh Cook, superintendent Lundoff-Bicknell Co., A. S. Innis and George F. Meyers. The company has acquired a factory at 6919 Quincy Avenue, which it has fitted up for a light structural steel and ornamental iron fabricating shop.

The Cleveland Piston & Mfg. Co., 13 West 70th Street, Cleveland, has placed contract for a one-story factory, 60 x 100 ft., on Scranton Road.

The A. C. Williams Co., Ravenna, Ohio, will erect factory additions that will increase its capacity about 50 per cent. The extensions will include a molding room and cleaning room. A second cupola will be added.

The Diamond Alloy Steel Co., Toledo, Ohio, manufacturer of alloy tool steel, has established quarters in a portion of the plant of the Toledo Milling Machine Co. The Diamond company was recently incorporated.

The Defiance Automatic Screw Co., Defiance, Ohio, has been incorporated with a capital stock of $15,000. The company will take over the plant formerly operated by the K & Z Automatic Screw Machine Co., recently sold at receiver's sale. L. F. Serrick will be manager.

The plant of the Blue-Bar Mfg. Co., Sycamore, Ohio, manufacturer of children,s vehicles, was burned a few days ago, the loss being estimated at $25,000.

A new foundry, 40 x 60-ft., is being erected for the Tiffin Bronze & Brass Co., Tiffin, Ohio.

Milwaukee

MILWAUKEE, June 18.

MACHINE-TOOL trade continues of moderate volume, but without strong characteristics. Orders come from widely scattered interests and generally call for single items or a few machines. No large lot inquiry has appeared in several weeks. A little railroad business is coming to local factors, but in the main developments have been below expectations. Paper mill and woodworking machinery builders are among the most active buyers of equipment. Automobile body factories furnish probably the best market for woodworking tools at present.

The Bucyrus Co., South Milwaukee, Wis., is making extensive purchases of shop equipment from time to time, corresponding with its plant extension and replacement program instituted about a year ago. At present work is being started on a new erecting shop. W. W. Coleman is president.

The Warner Malleable Iron Co., Hammond, Ind., resumed the operation of the former Stewart-Warner malleable shop at Beloit, Wis., on June 11, with a force of 100 men. It is working on large orders for light malleables for Ford, Chevrolet and Studebaker. A large steel furnace in the shop is being dismantled and will be replaced with another malleable furnace and additional annealing ovens to be ready about Aug. 1, when from 70 to 100 additional men will be employed. Harold Hemenway, who was for five years vice-president and general manager, Peoria, Ill., Malleable Castings Co., is general manager at Beloit.

The Common Council of Portage, Wis., has under consideration plans for a proposed $100,000 filtration unit for the municipal waterworks, designed by Pearsall, Greeley & Hansen, consulting engineers, 39 West Adams Street, Chicago. Work is to be put under way before the end of the year, but date for taking bids has not yet been fixed. Frank Kaiser is superintendent of the water department.

The Green Bay Dry Dock Co., Green Bay, Wis., expects to let contracts July 1 for a floating dry dock, 60 x 1250 ft., constructed in two sections, and estimated to cost $300,000. William F. Donnelly, 17 Battery Place, New York, is in charge of engineering details and equipment. Carl Hartman is president and general manager.

The Parker Motor Truck Co., 606-624 Linus Street, Milwaukee, is completing a reorganization and is preparing to re-engage in quantity production of commercial vehicles. Frank H. Parker, president, died several months ago. John E. Tracy, vice-president and general manager, is effecting the reorganization. Some retooling will be done, but in the main needs cover only replacements and several items of new equipment for increased production efficiency.

The Burlington Factory Advancement Co., Burlington, Wis., has awarded contracts for a one-story brick and concrete factory, 84 x 105 ft., for the use under lease by the Sanitary Dish-Washing Machine Co., now occupying leased quarters at 383-385 Tenth Street, Milwaukee. It is to be ready about Aug. 1. The Sanitary company will supplement its present shop equipment at once for delivery upon completion of the new plant in Burlington.

The Board of Education, Rhinelander, Wis., has engaged Smith, Reynolds & Brandt, architects, to design a vocational training institute costing $300,000, complete with equipment. The first unit will be erected this year and the second in 1924. Bids will be taken about July 15. Anna Moe is secretary of the board.

The Valley Automobile Co., Inc., 726 College Avenue, Appleton, Wis., plans the construction of a four-story garage, sales, service and maintenance building, 121 x 137 ft., at Washington and Morrison Streets, at a cost of $120,000. Foundations will be laid next fall and the structure completed in the spring of 1924. H. F. Heckert is president-treasurer and general manager.

The Green Bay Foundry & Machine Co., Green Bay, Wis., contemplates the erection of an addition to the gray iron foundry and conversion of a part of the present casting shop into a machine room addition. R. A. North is general manager.

The Eslien Sheet Metal Works, 1001 Thirtieth Street, Milwaukee, specializing in the manufacture of standardized portable buildings, private garages, etc., sustained an estimated loss of $35,000 by fire on June 12. The greater part of the original factory was destroyed. A new building was erected early this year and this will now be extended to cover the site of the damaged building. Much of the equipment will require replacement. Byron F. Eslien is president.

The Pittsburgh Plate Glass Co., 205-209 Lake Street, Milwaukee, will take bids June 20 through Kirchhoff & Rose, architects, 221 Grand Avenue, for the construction of Unit No. 2 of its general plant replacement project. The building will be five stories, 90 x 140 ft., and adjoin another structure of similar dimensions recently completed. Purchases of power plant equipment for the first unit are now being completed. The group will house the Patton-Pitcairn paint and varnish division. Ludington Patton is vice-president and general manager of Milwaukee works.

The Board of Industrial Education, Ladysmith, Wis., has accepted plans by E. J. Hancock, architect, Eau Claire, Wis., for a two-story addition, 52 x 60 ft., to the Ladysmith high school, to be erected at once and equipped as a vocational training institute. The total investment will be about $90,000. L. C. Streater is clerk of the board.

The Oneida Mfg. Co., Green Bay, Wis., is a new Wisconsin corporation organized with $400,000 capital stock to take over and continue the business of the Oneida Motor Truck Co., Green Bay. Besides building Oneida motor trucks, the company will engage in the manufacture and repair of machinery and mechanical appliances, which will require additional equipment. L. W. Melcher, general manager of the former company, is president and general manager of the new concern.

The Board of Regents, University of Wisconsin, Madison, Wis., expects to take bids after July 1 for an addition to the central heating plant, designed by John C. White, architect and engineer, care of State Power Plant, Madison. An appropriation of $88,000 is available. Two new 300-hp. boilers and auxiliary equipment will be purchased. M. E. McCaffrey is secretary of the regents.

The Madison Tool & Stamping Works, 1970 Helena Street, Madison, Wis., has opened a completely equipped machine shop for the servicing and rebuilding of passenger and

commercial cars, tractors, etc. It will continue the manufacture of metal specialties and automotive accessories.

The Northern Boiler & Structural Iron Works, Appleton, Wis., will start work June 25 on a brick and steel fabricating shop, 60 x 100 ft., superimposed on the present building, which later will be razed. Inquiry is being made for a small list of additional equipment. William H. Timm is president, and Edward Kottke, works manager.

The Lomira Mfg. Co. has been incorporated at Lomira, Wis., with $5,000 initial capital to manufacture barn and stable fixtures and other metal specialties for the farm. The incorporators are W. E. Muir, E. C. Brand and Walter F. Rutz.

The Wisconsin Duplex Percolator Co., Milwaukee, has been chartered in Wisconsin with a capital stock of $25,000 to manufacture percolators and other patented metal articles and specialties. Plans for production are still immature. The principals are R. J. Russell, C. L. Parkowski and F. J. Beyersdorf, 406 Ninth Avenue, Milwaukee.

G. B. Cotter, Merrill, Wis., has acquired a site, 280 x 520 ft., and will start work July 1 on a brick and concrete manufacturing plant, 36 x 118 ft., one-story, to be equipped with 16 steam-operated excelsior cutting machines. The initial investment will be about $45,000.

The Sun-Ray Healer Co., Green Bay, Wis., is a $10,000 corporation organized by A. E. Halterman, E. J. Bellows and A. L. McComb to manufacture portable electro-therapeutic devices and appliances. Quarters will be leased in an existing building pending the erection of a factory.

Cincinnati

CINCINNATI, June 18.

LOCAL manufacturers participated largely in railroad business placed at Chicago last week by the Sante Fe and the Chicago North Western, which bought against the lists recently issued. One local manufacturer is reported to have booked 12 lathes, and another a number of radial drills. A planer manufacturer received an order for five planers from the Chicago and North Western, while an engine lathe manufacturer booked an order for two lathes from the Santa Fe. A Connecticut manufacturer of machinery placed an order in Cincinnati for three large planers, while a Cleveland manufacturer bought one, and the Standard Sanitary Mfg. Co. also took one.

Some multiple spindle drilling machines have been sold for export to Spain, and inquiries have been received from England and South America for a number of these tools. Portable electric drill manufacturers report business keeping up well, and export inquiries are in fair volume.

The Denver & Rio Grande Western Railroad is expected to close on its list this week, and next week the Norfolk & Western is expected to buy the tools recently inquired for. The Burlington continues to take bids on its recent list. Early action is expected on the tools inquired for by the Pere Marquette. The United States Government is buying from time to time. A local manufacturer received an order for two lathes for Philadelphia, and one large lathe is expected to be placed this week for Galveston, Tex. An Indiana manufacturer is low bidder on three 16-in. lathes for Washington.

The Alaskan Engineering Commission, 422 Bell Street Terminal, Seattle, will take bids June 25 for miscellaneous equipment, including three engine lathes and one shaper. The Chicago, Milwaukee & St. Paul Railroad is reported to have a large list of tools ready to be issued as soon as the appropriation for the purchase is approved. Used machinery is moving in fair volume, the Fulflo Specialties Co., Blanchester, having been a good buyer during the past few weeks.

The Davis Welding & Mfg. Co., Cincinnati, has moved its chassis business to its new building at 1110-1120 Richmond Street, and has installed some new equipment. The tank manufacturing plant continues at its present location on Queen City Avenue. The company, besides doing a general welding business, makes a specialty of oil tank wagons.

The Fulflo Specialties Co., Blanchester, Ohio, manufacturer of pumps, is negotiating a large contract with an automobile manufacturer. The company is running practically full time on its regular line, and has added considerable equipment to take care of the larger volume of business offering.

The Clifton-Pratt Co., 1224 West Eighth Street, Cincinnati, is in the market for a stone crusher, 15 x 20 ft., or 15 x 24 ft. jaw.

The Moeschl-Edwards Corrugating Co., Covington, Ky., manufacturer of roofing and sheet metal specialties, has increased its capitalization from $50,000 to $200,000. The company contemplates extensions to its plant, but nothing will be done in the immediate future.

The Willard Middletown Machine Co., Middletown, Ohio, manufacturer of punch presses, will go out of business, and the plant and equipment will be sold.

The plant of the Kilbourne & Jacobs Mfg. Co., Columbus, Ohio, will continue in operation. The New York Trust Co. recently filed a mortgage foreclosure suit against the company for $900,000. It is probable that a reorganization of the company will soon be completed, which will insure the permanent operation of the plant.

The Dayton Steel Foundry Co., Dayton, Ohio, is erecting an addition and will install air compressors.

The Jeffrey Mfg. Co., Columbus, Ohio, manufacturer of coal mining machinery, will erect an office building, 97 x 215 ft., four stories. The company has purchased property adjacent to its plant for the purpose of providing room for future expansion, but nothing definite in the way of increasing facilities is contemplated at present.

The Ohio State Stove & Mfg. Co., Columbus, Ohio, manufacturer of stoves and ranges, will erect a three-story building, 90 x 280 ft., adjoining its present plant. M. L. Packer is general manager.

Indiana

INDIANAPOLIS, June 18.

BIDS are being taken by the Buescher Band Instrument Co., East Jackson Boulevard, Elkhart, Ind., for a two-story and basement addition, 100 x 150 ft., estimated to cost $75,000. A list of machinery will soon be arranged. A. H. Beardley is president.

The Kankakee Valley Electric Co., Wheatfield, Ind., will purchase the Wheatfield Light & Power Co. It will dispose of 50,000 shares of stock to finance the acquisition, a portion of the proceeds to be used for extensions and improvements in the power plant and transmission system.

The Board of Education, South Bend, Ind., will take bids for a new two-story vocational building at the central junior high school, 65 x 148 ft., estimated to cost $100,000. A list of machinery to be installed will soon be available. W. Ellwood, Russell Building, 220 West Jefferson Street, is architect.

Fire, June 13, destroyed a portion of the planing mill and lumber plant of the Smith & Smith Lumber Co., Valparaiso, Ind., with loss estimated at $40,000, including equipment.

The Machinery Clearing House, Indianapolis, machinery dealer, is in the market for woodworking machinery, including practically all standard tools; also for boilers of different types up to 10,000 hp. capacity.

The Chicago & Eastern Illinois Railroad Co., 332 South Michigan Avenue, Chicago, has engaged F. A. Eskridge, 6600 South Union Avenue, architect, to prepare plans for the initial buildings of its new locomotive and car shops at Terre Haute, Ind., to cost ultimately $4,500,000.

The Indiana Electric Corporation, Indianapolis, affiliated with the Merchants Heat & Light Co., is planning for the early installation of generating and other machinery in its new steam-operated electric power house, now being built near Terre Haute, Ind., to be known as Dresser, Ind. The plant will cost $5,000,000 with equipment and is expected to be ready for service by the end of the year. Stone & Webster, Inc., 147 Milk Street, Boston, is engineer.

The Leonard Range Co., Columbia and Roosevelt Avenues, Washington, Ind., will take bids for a new two-story and basement plant, including foundry and assembling department, estimated to cost $100,000 with equipment.

The F. W. Young Material Co., 1025 Lewis Street, Indianapolis, has plans for a new one-story planing mill and woodworking plant. The machinery will be electrically operated.

The St. Paul Tire & Rubber Co., St. Paul, Ind., has tentative plans for a new one-story works to cost $200,000 with machinery.

The City Council, Kendallville, Ind., has plans nearing completion for a one-story addition to the municipal electric light and power plant, and extensions in the waterworks, estimated to cost $50,000 with equipment. H. H. Mortoroff is engineer.

The Standard Oil Co. of Indiana, Indianapolis, is considering preliminary plans for the construction of an addition to its refinery at Whiting, Ind.

The Central South

ST. LOUIS, June 18.

THE market for machine tools in this district is quiet. No railroad lists are pending, and only an occasional tool is purchased by industrial concerns. The latest large list on which purchases have been made was the International & Great Northern Railroad, Houston, in which manufacturers' representatives at St. Louis displayed keen interest. Some of the most important items on the list were purchased by the following companies:

Manning, Maxwell & Moore: One Putnam 80-in. driving wheel lathe, one Putnam 36-in. geared head lathe, one Woodward & Powell 54-in. planer, two Columbia 32-in. shapers, three Boye & Emmes 20-in. geared head lathes, one Lenox rotary shear, one Chambersburg 3300 lb. steam hammer; American Tool Works: Three 18-in. lathes; Cincinnati Milling Machine Co.: One No. 2 universal milling machine; Colburn Machine Tool Co.: One 42-in. boring mill and Libby turret lathe.

Plans are being considered by the Spiral Machinery Co., St. Louis, manufacturer of plows and other agricultural equipment, for a branch plant at Longview, Wash., where a site is being selected. It will cost $50,000. L. S. Adams is president and general manager.

The Edwin F. Guth Co., St. Louis, recently organized, will take over and consolidate the St. Louis Brass Mfg. Co., 2615 Washington Street, and the Brascolite Co., Jefferson and Washington Streets, both specializing in the manufacture of electric lighting equipment. Expansion plans are being considered in the different departments, including spinning, stamping, machining, etc. Edwin F. Guth is president.

Fire, June 10, destroyed a portion of the plant of the Eagle-Picher Lead Co., Hillsboro, Mo., with loss estimated at $160,000, including equipment. It is planned to rebuild. Headquarters are at 208 South La Salle Street, Chicago.

The Common Council, Murray, Ky., is in the market for an oil-operated engine, about 200 hp., and auxiliary equipment for the municipal power house. M. T. Morris is in charge.

I. Rubin, 3535 Paseo Street, Kansas City, Mo., is having plans completed for a one-story machine shop, 35 x 90 ft., at Cherry Street and the Admiral Boulevard. H. F. Brandenburger, 100 Interstate Building, is architect.

The Uterpe Mines Co., Baxter Springs, Kan., has tentative plans for the rebuilding of the portion of its zinc concentration plant destroyed by fire June 7, with loss estimated at $100,000 including machinery.

The Fort Smith Fertilizer Co., Fort Smith, Ark., plans the construction of a power house at its new phosphate plant at Rudy, Ark., where 40 acres has been acquired. It will cost $80,000.

In connection with its new assembling plant at Memphis, Tenn., the Ford Motor Co., Highland Park, Mich., is planning the erection of a spoke and rim plant. A cotton-mixing mill, with power house, will also be erected, and a distributing terminal with traveling crane, conveying machinery, etc., installed on wharf space to be purchased. The entire project will cost in excess of $500,000 with equipment.

The Duncan Machinery Co., P. O. Box 265, Knoxville, Tenn., is in the market for an electrically-driven mechanical blower, small size; also for five standard gage logging cars, with capacity of about 30,000 lb., second-hand.

The Ford Block Co., Ashland, Ky., is planning the erection of a new branch factory in the vicinity of Huntington, W. Va., to manufacture concrete blocks and kindred products, estimated to cost $35,000 with machinery. E. A. Ford is general manager.

The Worland Implement Mfg. Co., Worland, Bates County, Mo., recently organized, is said to be planning for the establishment of a factory to manufacture agricultural implements and equipment. A. A. Blessing is secretary and treasurer.

The Arkansas Light & Power Co., Hot Springs, Ark., is perfecting plans for a new hydroelectric power plant on the Ouachita River, near Malvern, Ark., with capacity of about 15,000 hp., estimated to cost $1,500,000. Tentative plans are also being arranged for a similar plant on the Carpenter dam site, near Hot Springs. The company will also erect a new hydroelectric plant at the Remmel dam, now in course of construction, with initial installation of 18,000 kw., and a duplicating of this capacity later. The entire project with transmission lines will cost close to $5,000,000. Headquarters are at Arkadephia, Ark. H. C. Couch is president.

The Standard Specialty Co., Caldwell, Kan., manufacturer of metal signs, etc., is planning for the installation of a drill press and other equipment.

The Van Camp Packing Co., 1303 Shelby Street, Louisville, has plans for a new three-story oil refinery, 86 x 120 ft., estimated to cost $150,000 with machinery. Frederick Erhart, Norton Building, is architect. J. E. Gavin is secretary.

Manual training equipment will be installed in the proposed high school to be erected at Princeton, Ky., estimated to cost $110,000, for which plans are being prepared under the direction of the Board of Education.

The Kelly Lumber Co., Searcy, Ark., is planning the construction of a new mill at Garner, near Searcy. A power house and machine shop will also be built and the plant will cost approximately $90,000 with machinery. The company is operating a plant at Cunningham, Ark., and recently disposed of its mill at Wilmot, Ark., to the Long-Bell Lumber Co., Kansas City, Mo., which will make extensions and install additional equipment.

The Common Council, Madisonville, Tenn., will receive bids until July 3 for pumping and other equipment for installation at the municipal waterworks, including four centrifugal pumping units, two electric motors with automatic controls, two gasoline engines and auxiliary equipment. The Ambler Engineering Co., 610 Travelers Building, Richmond, Va., is engineer.

Manual training equipment will be installed in the new two-story and basement high school to be built at Monticello, Ky., estimated to cost $80,000, replacing a structure recently destroyed by fire. E. M. Ford, Somerset, Ky., is architect.

Manual training equipment will be installed in the three-story high school to be erected at Rexford, Kan., estimated to cost $100,000, for which plans are being drawn by Smith & English, Nelson Building, Hutchinson, Kan., architects.

The Elkhorn Star Coal Co., Pikeville, Ky., is planning the installation of electrical and mechanical equipment at its properties in the Elkhorn district. The company recently increased its capital to $175,000 for expansion. D. D. Sutton is president.

O. Kistler, 308 North Summit Street, Eldorado, Kan., operating a machine and repair works, has inquiries out for an automatic air compressor, electrically-operated.

Bonds have been voted for the installation of a municipal electric light and power plant at New London, N. C., for which plans will be prepared at once. J. W. P. Hill is secretary.

The Common Council, Paragould, Ark., has tentative plans for enlargements at its waterworks, and will soon take bids for the installation, including an electrically-operated centrifugal pump, control devices and other equipment.

The Pacific Coast

SAN FRANCISCO, June 12.

THE City Water Department, Van Nuys, Cal., is arranging for the removal of the Raymer Station machine and repair shop to a site on Aetna Street, where a new building will be erected to cost $25,000 and additional machinery installed. An appropriation of $100,000 has been granted to the Municipal Power Department for the construction of an electrical substation and service and repair works for motor department trucks and automobiles.

The Nevada Magnesite Products Co., Reno, Nev., recently organized, has plans for the construction of new works, about 9 miles from Reno, for the manufacture of composition stone products, including hollow blocks, tiles, etc. The plant will include a power house and machine shop and is estimated to cost $100,000 with machinery. Charles H. McCarthy is president and Paul Butler, vice-president.

A one-story vocational shop will be constructed at the Wilmington, Los Angeles, high school, to cost about $35,000, exclusive of equipment. The Board of Education is in charge.

The Riverside Portland Cement Co., Riverside, Cal., with headquarters at 724 South Spring Street, Los Angeles, has acquired the plant of the Golden State Portland Cement Co., Oro Grande, Cal. The new owner has plans for extensions to increase the capacity from 1200 to 3600 bbl. per day, to cost approximately $500,000 with equipment.

The Inland Empire Paper Mills, Inc., Spokane, Wash., has tentative plans for a hydroelectric development on the Spokane River, near Millwood, Wash., where a power site recently was acquired.

Sidney Wood, care of Nilon & Nilon, Grass Valley, Cal., attorneys, is at the head of a project to build and operate a hydroelectric power plant on the Big Canyon Creek, Nevada County, to cost in excess of $400,000.

A 10-ton traveling crane and other equipment will be installed in the new transformer warehouse to be constructed by the San Joaquin Light & Power Corporation, Fresno, Cal.,

at Orange and California Streets, estimated to cost $60,000. A. Emory Weston is general manager.

The Pacific Cedar Mfg. Co., Aberdeen, Wash., is planning the construction of a new local mill and power house estimated to cost $175,000 with machinery.

The Pacific Gas & Electric Co., 445 Sutter Street, San Francisco, will commence the construction of a new power house at Berkeley, Cal., to cost about $60,000.

John H. Scott, 900 Second Avenue, Seattle, will commence the erection of a one-story machine shop, 60 x 120 ft., estimated to cost $25,000. Stoddard & Son, Seattle, are architects.

The Standard Oil Co. of California, 200 Bush Street, San Francisco, has arranged for a note issue of $25,000,000, a portion of the proceeds to be used for extensions and improvements in its refineries and pipe lines, including additional equipment.

The Gulf States

BIRMINGHAM, June 18.

A SUBSIDIARY is being organized by the Gordon Petroleum Co., Eastland, Tex., to be known as the Continental Gasoline Co., operating under Delaware laws with capital of $250,000. Plans are under way for a new gasoline refinery in the Eastland oil field, estimated to cost $100,000 with machinery. Col. Robert D. Gordon is president of the parent company and will act in the same capacity with the new organization. H. B. Tanner is secretary and treasurer.

The Jacksonville Engine & Machine Works, 142 South Ocean Street, Jacksonville, Fla., has inquiries out for one 36 to 42-in. engine lathe, 22 to 24-ft. between centers, and one 12-in. engine lathe, 12-ft. between centers; also for a pipe-cutting and threading machine, steel shafting and other equipment.

A one-story power house will be erected by the Cloverland Dairy Co., Carrolton Avenue and Olive Street, New Orleans, in connection with a new dairy plant to cost about $300,000. Favrot & Livaudais, Hibernia Bank Building, are architects.

The Electric Signal Mfg. Co., Miami, Fla., recently organized with a capital of $500,000, is planning the establishment of a factory to manufacture electric signal equipment. H. W. LeVan, Miami, is president.

A. Y. Adelott, 2330 Avenue G, Birmingham, is in the market for vertical steam boilers, air compressors and other power equipment.

An electric power station and transmission system will be built by the Light and Water Commission, Talladega, Ala., in connection with a new waterworks system to cost $265,000. A pumping plant will also be installed.

Fire, June 9, destroyed a portion of the plant of the Southwestern Traction Co., Temple, Tex., including machine and repair shop, welding works, power house and car barn, with loss totaling $100,000, including machinery. It is undecided whether the plant will be rebuilt at this location.

The Welsh Machine Shops, Welsh, La., are planning for the installation of additional machinery to manufacture riveted spiral pipe, from 6 to 24 in. in diameter, and lengths up to 20 ft.

The United States Engineer Office, New Orleans, will take bids until July 5 for two 20-in. dredging pumps and auxiliary equipment, proposal 2126.

The Palo Pinto Oil & Refining Co., Mineral Wells, Tex., is being organized to take over and succeed the Brazos Gasoline Co., operating a local refinery. The new company plans enlargements and the installation of machinery to develop an output of about 500 bbl. a day. It will cost $75,000, including power equipment and pipe lines.

Briggs & Co., 3815 Parry Street, Dallas, Tex., operating a machine shop, are planning the installation of additional equipment, including a drill press, power lathe, bench and hand tools, and transmission machinery.

The Board of Commissioners, Fort Worth, Tex., will receive bids until July 3 for one centrifugal pump with capacity of 12,000,000 gal. per 24 hr., operating under a head of 270 ft., motor-driven. Alternate proposals will also be received for the pumping unit driven by Diesel engine. Dudley L. Lewis is city engineer; C. S. Snow is secretary.

The G. R. Mueller Co., Brown-Marx Building, Birmingham, machinery dealer, has inquiries out for one air compressor, 600 cu. ft. capacity, complete with unloading device, direct-connected to electric motor; one steam-driven air compressor, 400 cu. ft. capacity, and one 125 to 150-hp. motor, 220 volts, three-phase, 60-cycle, complete with starter, base and pulley, etc.

The Tampa Bay Fertilizer Co., Tampa, Fla., recently organized with a capital of $1,000,000, plans the construction of a new plant, to include a power house and machine shop, estimated to cost $250,000 with machinery. S. W. Allen is president.

The Mississippi Power & Light Co., Jackson, Mass., recently organized, will take over and merge the Jackson Public Service Co., Jackson; Delta Light & Traction Co., Greenville, Miss.; Vicksburg Light & Traction Co., Vicksburg; and the Columbus Railway, Light & Power Co., Columbus, Miss. The consolidated company has plans under way for extensions to power plants and transmission systems, estimated to cost $200,000.

The Board of School Commissioners, Mobile, Ala., will commence the construction of a new two-story industrial high school for negro pupils, 80 x 125 ft. A list of equipment to be installed will soon be arranged. C. L. Hutchison, Emanuel Building, is architect.

Manual training equipment will be installed in the new central high school to be erected at Clearwater, Fla., estimated to cost $160,000. M. Leo Elliott, Citizens' Bank Building, Tampa, Fla., is architect.

Officials of the Great Southern Lumber Co., Opelousas, La., have tentative plans for a new pulp and paper mill on the Warrior River, vicinity of Tuscaloosa, Ala., to cost $500,000. W. H. Sullivan is president.

A. T. Rossetter, Sanford, Fla., has inquiries out for a clamshell bucket, about ½-yd. capacity, new or second-hand.

The Sinclair Pipe Line Co., Houston, Tex., a subsidiary of the Sinclair Consolidated Oil Corporation, will build a series of pumping plants in connection with its new pipe line from Mexia, Tex., to the Sinclair refineries, Ship Channel, Houston, about 200 miles.

The American Furnace Co., Commerce, Tex., recently organized, is said to be perfecting plans for works to manufacture special furnaces, using gasoline as fuel. T. M. Nelson is president, and H. D. Wynn, secretary and treasurer.

W. H. Dexter, P. O. Box 665, Jacksonville, Fla., machinery dealer, is in the market for two used 100 to 150-hp. motors, 2300 volts, three-phase, 60-cycle, second-hand.

Canada

TORONTO, June 18.

A STRONG demand for machine tools continues to feature the market. While the month of May was one of the best experienced in the past two years, it is now expected that June sales will be even better. While large lists are not numerous, they are appearing from time to time with the result that dealers and builders are closing a very good volume of business.

During the past week the Toronto Transportation Commission, Toronto, Ont., awarded contracts on the large list it recently issued for some $100,000 worth of tools for the new car shops under construction in Toronto. The Laminated Materials, Ltd., Sapperton District, B. C., is placing orders for machinery to increase the output of its plant for the manufacture of cottonwood veneer. Small tools are in good demand.

The Phillips Gies Foundry, Kitchener, Ont., has taken over the plant and equipment of the U. O. Phillips Co., and will manufacture a line of gasoline pumps and motor specialties.

C. W. Dawson, chairman Guelph Advisory Industrial Committee, 9 Clinton Street, Guelph, Ont., will purchase lathes, drills, milling machines, woodworking machines, and auto accessories for the machine, automechanics and woodworking shops for the new vocational school.

The town of Moncton, N. B., will call for bids at an early date for an addition to the waterworks plant to cost about $25,000. S. B. Anderson is clerk.

The Western Steel Products, Ltd., Winnipeg, Man., is establishing a branch plant at Port Arthur, Ont., under the management of B. F. Cameron, formerly superintendent Northern Engineering Co., Fort William, Ont. The company has secured the buildings formerly occupied by the Lake Side Lumber Co., at Inter-City, and will commence operations as soon as equipment can be installed. The products of the company include range boiler, oil barrels, storage tanks, metal lath, fire-proof doors, etc.

The Provincial Department of Public Health has ordered Port Colborne, Ont., to take immediate steps to install new waterworks plant. The cost is estimated at $75,000, and will include new intake, filtration plant and new pumps.

The National Cement Co. has started work on the erection of a large plant in Montreal East, where it has secured a site of 110 acres. Including equipment it will cost approximately $1,500,000.

The Eugene F. Phillips Electrical Works has closed an agreement with the Board of Trade, Brockville, Ont., to

remove its entire plant from Montreal to Brockville. It will cost between $2,500,000 and $3,000,000 and will employ about 600. Up to the present only one unit has been erected and it is proposed to construct 15 additional.

The Beacon Tire & Rubber Co., Allandale, Ont., has purchased 3 1/2 acres and will erect a manufacturing plant. W. Feldman is vice-president.

The Backus-Brooks Co. proposes to remodel a power plant at Kenora, Ont. J. T. McLellan is construction manager.

The Ontario Government has granted a new power site at Portage Place to the Hollinger Gold Mines, Toronto. A power house will be erected about 60 miles from Timmins, Ont. Bids will soon be called for the construction of the plant, the initial development of which will be about 20,000 hp.

Charles Murphy, Western manager Canadian Pacific Railway, has approved plans for car shops to be constructed at Vancouver, B. C., at a cost of $100,000. Work will be started without delay.

The Howard Smith Paper Mills, Cornwall, Ont., will make additions and improvements to its plant and will soon call for bids for the construction of a new finishing room, 180 x 200 ft., three-stories of reinforced concrete which will increase the capacity of the plant by 50 per cent. An addition, 52 x 100 ft., will also be built to the machine room.

The British Columbia Electric Railway Co., Victoria, B. C., is preparing to go ahead with a construction program which will greatly increase the power capacity of its mainland plants and cost approximately $10,000,000. Construction work on new power units will be started as soon as the Provincial Government gives its formal sanction to the company's plans and it is expected that the proposed additions will be sufficient to meet the requirements for the Province for the next fifteen years. The largest plant proposed will be constructed near Ruskin and will have a capacity of about 80,000 hp.

W. H. Banfield & Sons, Ltd., Toronto, Ont., is in the market for used chilled iron rolls for rolling hot rolled steel. Letters should be addressed to L. J. Tuttle, purchasing agent.

Fourth Sectional Meeting of the American Society for Steel Treating

(*Concluded from page* 1780)

proper effect but the time element would be too long for practical purposes. One slide showed the crystalline structure of an ingot. Where ingots are small, fingerlike crystals form at the outside and shoot toward the center. In ingots over 6 in. by 6 in. the solidification point is reached at a number of different places, from which the crystals grow. Heat treatment, he said, would completely eradicate the crystals, producing a very fine structure, but the lines which form in the outside through first solidification from cooling by the walls of the mold cannot be eradicated in this manner. These so-called columnar crystals are one of the reasons for forging, which is done to make them conform to the contours of the piece.

Other slides showed different forms of slag or inclusions which are always present in steel, the structure of an ingot as cast and after forging, annealing, oil quenching and drawing.

The line or course followed by corrosion was shown in cases to be governed by the grain structure in some high chromium steel bolts which had been subjected to mine water. Some of the spots were shown to have worked out to the surface from the inside after corrosion had started at another point on the surface and worked in, then out, following the grain boundary. It was found in the specimen photomicrographed that the boundaries of the crystals consist of small globules causing additional uniformity in the crystal boundary, increasing the electrolytic action and causing the corrosion. The conclusion was that the heat treatment had been insufficient to put the small globules into thorough solution, it being thought that these globules are the compound carbides of chromium and iron. Resistant properties of the high chromium steels depend mostly upon proper heat treatment, he said.

Another slide exhibited by Mr. Christ showed the effect in two 1-in. round bars which has been heat-treated and showed the same hardness under Brinell test. One bar would show the same elastic limit and tensile strength as the other, yet fail in extension and contraction. On examination the picture of the failed bar showed that a thorough solution had not been obtained because of low heat and that the quench had not been sufficiently rapid to give enough penetration to hold the constituents which were in solution. An increase in holding time of the heat and a higher quenching temperature, he said, corrected the trouble.

Other slides showed the effect of etching in determining the extent of surface cracks or whether what looked like cracks were really cracks. In some cases it was found that the usual method of polishing before etching would not serve to locate the defect. Excessive over or under-polishing was found necessary. This was due to the minute size of the defect, which would be covered by a film of amorphous metal with the usual polishing methods.

An apparently anomalous situation was developed in some tests made on forgings. One forging which lasted one month under reversals of stress and shock tests showed uniform structure. Another was slightly porous and gave two months' service. Another forging which lasted four months showed a decidedly porous structure and also some spots in the center. Some 50 or 60 forgings were so tested with about one-third of them of this composition and all seemed to act in the same manner. Tests along this line have not been completed.

The last paper before the meeting was by V. Hybonette, of the British-American Nickel Co., Wilmington, Del., on "The Developments of Heat-Resisting Metals." This was largely a description of results obtained in use of a special alloy delevoped by that company which it is claimed will remain unchanged at 1150 deg. C. Many alloys survive at 850 to 1000 deg. C., few above that temperature. Exact details of the alloy were not given. Examples were cited by the use of this alloy in the chemical industry, for electric installations and for use as heat-treating boxes.

The Visit to the Steel Works

A well-planned and informative trip through the plant of the Bethlehem Steel Co. was the program for Friday morning, June 15.

The visitors congregated at the permanent exhibit of the company, where are shown samples and models of the company's widely diversified activities, from sections of the smallest bars rolled to models of ships built. The exhibit includes shapes, drop and regular forgings, tool steels, charcoal iron products, ship fittings, safety appliances in use in the plant, specimens of ores, and coke making and other activities connected with the steel industry. One exhibit which shows strikingly the effect of heat treatment was a platform carrying various sections of beams, forgings, etc., all suspended, pendulum fashion, from a ½-in. diameter test piece, the total weight held being 38,400 lb.

From the exhibit the trip extended through the manufacturing departments such as the open-hearth plants, the rolling mills, including the rail mill and merchant mills, and the forge and machine shops. In the forge shop was a hollow bored ingot being forged under a hydraulic press. This ingot weighed 120,000 lb. and was being forged for a reaction chamber to be used in the manufacture of gasoline. A similar forging was later seen being turned in the machine shop. The manufacture of motor truck wheels, made from I-beams, is the work handled in another building visited. In the heat-treating department visitors were shown the manner of heat treatment and testing. The trip was completed in the brass foundry where were shown centrifugally cast bronze rolls for paper mill work, blast furnace tuyeres, etc.

The inspection was under the direction of A. P. Spooner, metallurgical engineer, Lehigh plant; G. C. Lilly, in charge of heat treating; W. H. Laury, assistant test engineer, and W. R. Shimer, chief metallurgist of Bethlehem interests.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.54c.
Swedish bars, base price	7.50c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees 3 in. x ¼ in. and larger, base	3.64c.
Channels, angles and tees under 3 in. x ¼ in., base	3.54c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	4.10c.
Toe-calk, ½ x ⅜ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth, spring-steel	5.00c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c. to 4.65c.
Squares, flats and hex	4.90c. to 5.15c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High speed steel, 18 per cent tungsten	75c. to 80c.

Tank Plates—Steel

¼ in. and heavier	3.64c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.59c.
No. 12	4.64c.
No. 14	4.69c.
No. 16	4.79c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.55c. to 4.95c.	.....
Nos. 22 and 24	4.60c. to 5.00c.	5.35c.
No. 26	4.65 to 5.05c.	5.40c.
No. 28	4.75c. to 5.15c.	5.50c.
No. 30	4.95c. to 5.35c.	.....

No. 28 and lighter, 36 in. wide, 10c. higher

Galvanized

	Per Lb.
No. 14	4.85c. to 5.25c.
No. 16	5.00c. to 5.40c.
Nos. 18 and 20	5.15c. to 5.55c.
Nos. 22 and 24	5.30c. to 5.60c.
No. 26	5.45c. to 5.85c.
No. 27	5.60c. to 6.00c.
No. 28	5.75c. to 6.15c.
No. 30	6.25c. to 6.65c.

No. 28 and lighter, 36 in. wide, 20c. higher

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt...	—41	—24	½ in. Butt...	— 4	+19
¾ in. Butt...	—46	—32	¾ in. Butt...	—11	+ 9
1-3 in. Butt..	—48	—34	1-1½ in. Butt.	—14	+ 6
2½-6 in. Lap.	—44	—30	2 in. Lap....	— 5	+14
7-8 in. Lap..	—41	—11	2½-6 in. Lap.	— 9	+ 9
9-12 in. Lap.	—34	— 6	7-12 in. Lap..	— 3	+16

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	5.00c.
Annealed soft	5.00c.
Galvanized annealed	5.65c.
Coppered basic	5.65c.
Tinned soft Bessemer	6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	20½c. to 21½c.
High brass wire	21 c. to 22 c.
Brass rods	18¾c. to 19¾c.
Brass tube, brazed	28½c. to 29½c.
Brass tube, seamless	25½c. to 26½c.
Copper tube, seamless	27 c. to 28 c.

Copper Sheets

Sheet copper, hot rolled, 24¼c. to 25¼c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14 x 20	
			Prime / Seconds
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb..	$6.80 / $6.55
		90 lb..	6.90 / 6.65
		100 lb..	7.00 / 6.75
IC..	$11.00	$9.75	IC.. 7.15 / 6.90
IX..	12.25	11.00	IX.. 8.15 / 7.90
IXX..	13.50	12.25	IXX.. 9.15 / 8.90
IXXX..	14.75	13.50	IXXX..10.15 / 9.90
IXXXX..	16.50	14.75	IXXXX..11.15 / 10.90

Terne Plates

8-lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits pig	45c.
Bar	53c. to 58c.

Copper

Lake ingot	17½c.
Electrolytic	17 c.
Casting	16¾c.

Spelter and Sheet Zinc

Western spelter	8 c.
Sheet zinc, No. 9 base, casks	10¼c. open 10¾c.

Lead and Solder*

American pig lead	8½c. to 9c.
Bar lead	12c. to 13c.
Solder, ½ and ½ guaranteed	32c.
No. 1 solder	30c.
Refined solder	26½c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c. to 90c.
Commercial grade, per lb	35c. to 50c.
Grade D, per lb	25c. to 35c.

Antimony

Asiatic	8½c. to 9c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	32c. to 33c.

Old Metals

The market is unsettled but prices are practically unchanged. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	12.75
Copper, heavy wire	12.00
Copper, light and bottoms	10.25
Brass, heavy	6.75
Brass, light	5.50
Heavy machine composition	9.50
No. 1 yellow brass turnings	6.75
No. 1 red brass or composition turnings	8.50
Lead, heavy	6.00
Lead, tea	4.50
Zinc	4.25